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# Family Economics and Nutrition Review

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# Diet-Related Knowledge, Attitudes, and Practices of Low-Income Individuals With Children in the Household

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Despite progress towards implementing the *Dietary Guidelines for Americans*, many consumers are still not eating enough fruits, vegetables, or grains. In addition, many people continue to eat high-fat diets. Developing a better understanding of consumers' food and nutrition-related knowledge, attitudes, and practices is an important preliminary step in changing dietary behavior. This study compares the nutrition-related knowledge, attitudes, and practices of low- and higher income American consumers with children in the household using data from the 1994 Continuing Survey of Food Intakes by Individuals and Diet and Health Knowledge Survey. Compared with higher income respondents, low-income respondents with children in the household were found to be less aware of diet-disease relationships, less likely to use the nutrition panel on the food label when buying foods, and significantly less likely to have lowfat and low cholesterol eating practices. Low-income respondents with children were more concerned with price, convenience, and how well food keeps than were higher income respondents. Results have implications for focusing nutrition education and promotion efforts for the low-income population with children. Nutrition educators and promotion messages must be realistic about the limited means and competing concerns of low-income consumers when attempting to improve their eating practices.

**K**nowledge regarding nutrition and its influence on health and longevity has greatly increased over the last decade. National efforts such as the promotion of the *Dietary Guidelines for Americans* (4) and *The Food Guide Pyramid* (25) have attempted to relay

this information to consumers and to change their eating practices. In addition, several national programs have targeted low-income consumers for nutrition education. The U.S. Department of Agriculture's (USDA) Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) provides



nutrition education as well as food assistance to low-income pregnant and postpartum women and to children up to the age of 5 years. For FY 1997, Congress has appropriated \$3.7 billion for the WIC program that will benefit more than 7 million people each month (24).

USDA also sponsors the Expanded Food and Nutrition Education Program (EFNEP) that provides nutrition education to low-income consumers, focusing its primary emphasis on households with children. In FY 1994, over \$60.5 million was budgeted for EFNEP. Approximately 426,800 youths and 198,900 adults were reached by the direct teaching of EFNEP in FY 1994. In addition, 737,800 family members were reached indirectly (21). The Department of Health and Human Services (DHHS) sponsors Head Start for low-income children, which also includes a nutrition component. In FY 1995, over \$3.5 billion was budgeted for the Head Start program serving over 750,000 children (27).

It may seem logical that higher levels of nutrition knowledge and more favorable attitudes toward nutrition would be associated with better diet quality. Nevertheless, the precise nature of the relationship between nutrition knowledge or attitudes and dietary behavior has been the subject of considerable controversy. Although some studies have identified positive associations between knowledge or attitudes or both and dietary behavior, others have not (2).

To resolve the question, two groups of researchers conducted meta-analyses of studies examining this relationship (2, 10). Both groups found significant relationships, although the estimated effect-sizes were small. Axelson et al. (2) hypothesized that among the possible

reasons for the small effect-sizes were problems of measurement with the variables under examination and/or a lack of correspondence between the measures of dietary intake and knowledge or attitudes.

Lack of correspondence between measures may be a problem in many studies, since nutrition-related knowledge is a broad area that can range from an understanding of the chemical structure of a nutrient to a practical ability to prepare tasty lowfat meals. Generally, theory suggests that the more directly related a particular area of knowledge is to a behavior, the more likely it is to have an impact on that behavior.

In the area of dietary behavior, more recent research seems to support this theory. For example, in a longitudinal study of factors predicting dietary change, Smith et al. (16) found improvements in applied knowledge of food selection to be significantly associated with dietary change. Other types of nutrition-related knowledge, such as awareness of diet-disease relationships (28) and knowledge of food guide serving recommendations (8,16), were found to have significant effects on dietary status. Among low-income consumers, nutrition education programs that also include practical education on food shopping and budgeting, such as those offered by EFNEP, have been shown to improve diet quality (1, 3, 18).

Increases in parents' nutrition-related knowledge have also been found to lead to improvements in the diets of their children (29). Koblinsky et al. (11) found that nutrition education programs can have a positive effect on Head Start parents' nutrition-related behaviors and can lead to improvements in the diets

of children who have been eating fewer than the recommended number of servings of nutritious foods.

The objective of this study was to compare the level of nutrition knowledge of low- and higher income American consumers with children in the household below the age of 18. Attitudes and practices reported by the income groups were also compared. Recent statistics show that the poverty rate for children under age 18 is 23 percent, so it is especially important to examine the nutrition knowledge of low-income families with children since these families must strive to provide a nutritious diet to their children with few resources (26). In fact, children under age 19 made up 74 percent of the principal recipients of USDA's 14 food assistance programs in FY 1992 (7). Findings may be useful to professionals and policymakers working on the design and/or implementation of nutrition education and promotion programs directed towards low-income households with children.

## Methods

### Description of the 1994 Continuing Survey of Food Intakes by Individuals/ Diet and Health Knowledge Survey

Data for this study are from the 1994 Continuing Survey of Food Intakes by Individuals (CSFII) and the 1994 Diet and Health Knowledge Survey (DHKS), conducted by the Agricultural Research Service, U.S. Department of Agriculture. The 1994 CSFII/DHKS was designed to obtain a nationally representative sample of noninstitutionalized persons residing in households in the United States. Persons living in group quarters or institutions, those residing on military installations, and the homeless were excluded.

For the CSFII, 2 nonconsecutive days of dietary data for individuals of all ages were collected using the 24-hour recall method.<sup>1</sup> Interviews were conducted between mid-January of 1994 and mid-January of 1995. The survey includes information on food and nutrient intakes by 5,589 individuals who provided at least 1 day of dietary data (20). The CSFII consists of an all-income and a low-income sample. For the low-income sample, participation was limited to individuals in households with gross income for the previous month at or below 130 percent of the Federal poverty thresholds.<sup>2</sup> The all-income sample and the low-income sample were combined to form the final data set.

Approximately 2 to 3 weeks after the CSFII was completed, one adult from each CSFII household was interviewed for the DHKS. In households with more than one CSFII participant 20 years of age and over, one of the participants was selected randomly<sup>3</sup> with probability assigned to maintain distributions of all-income and low-income individuals in the six sex-age groups<sup>4</sup> that conformed to the corresponding distributions of individuals in the CSFII. The DHKS respondent serves as the reference person whose knowledge, attitudes, and practices represent the household.

<sup>1</sup>For the 1994 CSFII, data were collected from selected individuals within each household rather than from all household members as in past surveys.

<sup>2</sup>For the 1994 CSFII, the 1993 weighted average Federal poverty threshold was used. For 1993, 130 percent of the Federal poverty threshold was \$19,192 for a family of four.

<sup>3</sup>In the 1989-91 DHKS, the main meal planner or preparer was selected as the DHKS respondent.

<sup>4</sup>Sex-age groups included males and females ages 20-39, 40-59, and 60 and older.

Information regarding food labeling and dietary behaviors related to fat intake was also collected.

There were 1,879 individuals 20 years of age and over who participated in the DHKS. Eighty-four percent of DHKS interviews were completed by telephone; face-to-face interviews were conducted for households without telephones or where an interpreter was needed. The 1994 DHKS had a response rate of 71 percent. Sample weights were developed to compensate for variable probabilities of selection, differential nonresponse rates, and sampling frame considerations.

### Study Sample Methodology

The unweighted sample for this study consisted of 1,879 individuals—every respondent in the 1994 DHKS. Of these respondents, 658 had children in the household who were below the age of 18. Of the 658 respondents with children, 327 lived in low-income households. Although the CSFII/DHKS defined low-income as those at or below 130 percent of the Federal poverty thresholds,<sup>5</sup> for this research low-income respondents were redefined to include those with household income at or below 185 percent of the Federal poverty thresholds. This income level is the income cutoff for participation in the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) and for receipt of reduced-price school meals through the National School Lunch and School Breakfast Programs (23).

Those respondents with household income exceeding 185 percent of the Federal poverty guidelines were classified as having “higher income.” For purposes

<sup>5</sup>Poverty thresholds are established for households of different sizes, including unrelated individuals.

of comparison, data for all respondents—as well as for respondents with children—are presented.

For this study, nutrient data from the CSFII were not used. However, other data from the CSFII were used, such as ages of household members and percentage of household members who participate in WIC and school breakfast and lunch programs.

Descriptive statistics for this study were derived using the SPSS statistical software package (17) and were weighted to reflect population estimates. Tests of significance (chi-square and t-tests) were performed on weighted data and reported at the .05 level using the SUDAAN software package, which accounts for the effects of the complex design of the CSFII/DHKS surveys (15).

### Results

#### Household Characteristics of Respondents With Children

Among low-income respondents, those with children were less likely to have very low incomes. Twenty-four percent of low-income respondents with children had a before-tax household income of \$9,999 or less, compared with 33 percent of low-income respondents from the total sample (table 1).

Among individuals with children, low-income respondents were significantly more likely than those with higher income to have young children in their household. Among respondents with children, low-income respondents were significantly more likely to have a female as sole head of household. Twenty-three percent of low-income respondents, compared with 6 percent of higher income respondents, had a female household head.



**Table 1. Household characteristics of respondents, DHKS 1994**

Characteristic	All <sup>1</sup>			With children <sup>2</sup>		
	Low income	High income	Significance	Low income	High income	Significance
	<i>Percent<sup>3</sup></i>			<i>Percent<sup>3</sup></i>		
<b>Before-tax household income</b>			*			*
Less than \$9,999	33	—		24	—	
\$10,000 - \$19,999	45	4		38	Δ	
\$20,000 - \$29,999	17	15		27	5	
\$30,000 - \$39,999	5	19		10	17	
\$40,000 - \$49,999	Δ	16		1	20	
\$50,000 and over	—	46		—	58	
<b>Age of children in household (years)</b>			*			*
0 - 2	19	9		38	25	
3 - 5	22	9		45	25	
6 - 8	16	9		32	25	
9 - 11	11	10		23	26	
12 - 14	11	10		21	27	
15 - 17	12	11		23	30	
<b>Householder present</b>			*			*
Female	28	13		23	6	
Male	9	8		1	Δ	
Female and male	63	80		76	94	
<b>Households with WIC recipient</b>	12	1	*	22	3	*
<b>Households with food stamp recipient</b>	25	2	*	35	4	*
<b>Households that receive free or reduced-price school lunch</b>	20	2	*	41	5	*
<b>Households that receive free or reduced-price school breakfast</b>	13	1	*	27	3	*
<b>Households that receive free or reduced-price school lunch or breakfast</b>	21	2	*	43	5	*

<sup>1</sup> n = 1,879, unweighted data.

<sup>2</sup> n = 658, unweighted data.

<sup>3</sup> Valid percent for each variable.

\* Indicates that a statistically significant difference at  $p < .05$  occurs within the characteristic based on weighted data.

Δ Less than .5 percent.

— Sample size = 0.

**Significantly more respondents in the low-income group than those in the higher income group rated how well the food keeps, price, and ease of preparation as very important.**

Low-income respondents with children were also significantly more likely than their higher income counterparts to have a household member who participated in USDA food assistance programs. Of low-income respondents with children, 22 percent had a household member who participated in WIC; 35 percent, someone who participated in the Food Stamp Program; and 43 percent, someone who received a free or reduced-price school lunch or breakfast. In contrast, less than 6 percent of higher income respondents with children had a household member who participated in any of the food assistance programs.

#### **Characteristics of Respondents With Children**

A significant difference was found between the body mass indexes (BMI) of low-income respondents with children in the household and their higher income counterparts (table 2). The mean BMI of low-income respondents was 27, while that of higher income respondents was 26. The 1995 Dietary Guidelines Advisory Committee has defined a BMI of 25 as being the upper limit of the range for healthy weight (4).

This finding is consistent with results from other studies. Frongillo et al. found that those with low income tend to be more food insecure and to have a higher BMI. This may indicate that nutrition educators have an additional challenge when working with low-income households, who must manage with few resources (6).

Mean ages of low-income respondents with children and higher income respondents with children were similar, 36 and 38 years old, respectively (table 2). Further analysis showed that the low-income respondents were more likely than higher income respondents to be

under age 40. Thirty-five percent of low-income reference persons with children were ages 20-29, compared with only 15 percent of higher income reference persons with children. The mean age of all respondents—with and without children—was 45.

There were significantly fewer white low-income respondents with children than higher income white respondents with children. No significant difference between income groups was found with regard to sex of respondents. However, for the total sample, there were significantly fewer low-income male respondents than higher income male respondents.

Low-income respondents with children were significantly more likely to have a lower level of educational attainment than higher income respondents with children. Seventy-six percent of low-income respondents had a high school diploma or less, compared with 41 percent of higher income respondents.

No significant difference between income groups was observed for region of residence. Low-income respondents with children were significantly more likely than other respondents to live in a central city. Almost half of the low-income respondents lived in a central city, whereas over half of higher income respondents lived in a suburban area.

A significant difference between the two income groups was found in respondents' employment rates.<sup>6</sup> Forty-seven percent of respondents in the low-income group with children were unemployed. In contrast, only 21 percent of the higher income group with children were unemployed.

<sup>6</sup>For employment status, the category of "employed but not at work last week" was excluded from the analysis.

**Table 2. Characteristics of respondents, DHKS 1994**

Characteristic	All <sup>1</sup>			With children <sup>2</sup>		
	Low income	High income	Significance	Low income	High income	Significance
Sample size	758	1,121		327	331	
Average age	45	45		36	38	
Body Mass Index (BMI)	27	26	*	27	26	*
	<i>Percent<sup>3</sup></i>			<i>Percent<sup>3</sup></i>		
<b>Sex</b>			*			
Male	41	50		42	48	
Female	59	50		58	52	
<b>Race</b>			*			*
White	71	85		63	83	
Non-White	29	15		37	17	
<b>Age of reference person (years)</b>			*			*
20 - 29	27	17		35	15	
30 - 39	24	26		36	47	
40 - 49	14	20		16	28	
50 - 59	8	17		8	8	
60 - 69	12	12		4	2	
70 and over	15	9		1	1	
<b>Education</b>			*			*
Less than high school	35	10		31	6	
High school	37	34		45	35	
At least some college	18	23		17	23	
College degree or more	10	33		7	36	
<b>Region of residence</b>						
Northeast	21	20		16	17	
Midwest	20	25		20	26	
South	40	33		38	35	
West	19	22		26	22	
<b>Urbanization</b>			*			*
Central city	44	31		45	28	
Suburban	32	51		31	55	
Nonmetropolitan	24	19		24	18	
<b>Employment</b>			*			*
Full time	31	57		40	67	
Part time	13	12		13	13	
Not employed	57	31		47	21	
<b>Meal planners</b>	72	59	*	64	52	

<sup>1</sup> n = 1,879, unweighted data.

<sup>2</sup> n = 658, unweighted data.

<sup>3</sup> Valid percent for each variable.

\*Indicates that a statistically significant difference at p < .05 occurs within the characteristic based on weighted data.

**Table 3. Respondents' awareness of diet-disease relationships, DHKS 1994**

Relationship	All <sup>1</sup>		With children <sup>2</sup>	
	Low income	High income	Low income	High income
<i>Question: What you eat can make a big difference in your chance of getting a disease, like heart disease or cancer?</i>				
	Percent answering "Strongly Agree"			
	58	60	55	58
<i>Question: Have you heard about any health problems caused by:</i>				
	Percent answering "Yes" <sup>3</sup>			
<b>Behavior</b>				
Eating too much fat	85*	90	86	87
Not eating enough fiber	52*	69	52*	66
Eating too much salt or sodium	86	89	84	87
Not eating enough calcium	73*	84	72*	87
Eating too much cholesterol	82*	92	82*	91
Eating too much sugar	80	82	79	79
Being overweight	92*	96	92*	97

<sup>1</sup> n = 1,879, unweighted data.

<sup>2</sup> n = 658, unweighted data.

<sup>3</sup> Valid percent for each behavior.

\* Statistically significant at p < .05 based on weighted data.

## Knowledge, Attitudes, and Practices

### Awareness of Diet-Disease Relationships

In general, low-income respondents with children in the household were less likely than higher income respondents to be aware of diet-disease relationships. Low-income respondents were slightly, but not significantly, less likely to believe that *what you eat can make a big difference in your chance of getting a disease, such as heart disease or cancer* (table 3). Low-income respondents with children were significantly less likely than those with higher income to have heard about health problems caused by not eating enough fiber, not eating enough calcium, eating too much cholesterol, and being overweight.

### Knowledge of Food Group Servings Recommendations

Although the Food Guide Pyramid (25) has appeared in a wide number of nutrition education materials since 1992, very few respondents from either income group reported the correct number of recommended servings from the bread, cereal, rice, and pasta food group (table 4). Low-income respondents with children (2 percent) were significantly less likely than their higher income counterparts (9 percent) to answer correctly for this food group. Also, low-income respondents with children were less likely than those with higher income to report correctly the recommended servings for the vegetable group. This relationship was

significant when income groups for all respondents—with and without children—were compared.

A relatively high percentage of respondents from both income levels answered correctly regarding the recommended servings from the meat, poultry, fish, dry beans, and eggs group (over 60 percent) and the fruit group (over 70 percent). About half answered correctly regarding the number of servings one should consume from the milk, yogurt, and cheese group. However, low-income respondents with children were less likely than their higher income counterparts to report the correct number of servings from this food group.

**Table 4. Respondents' knowledge of correct Food Guide Pyramid recommended servings, DHKS 1994**

Food group	All <sup>1</sup>		With children <sup>2</sup>	
	Low income	High income	Low income	High income
	<i>Percent answering correctly according to Food Guide Pyramid recommendations<sup>3</sup></i>			
Fruit	75	74	77	71
Vegetable	44*	51	45	52
Milk, yogurt, and cheese	52	56	47	57
Bread, cereal, rice, and pasta	4	7	2*	9
Meat, poultry, fish, dry beans, and eggs	59	59	65	61

<sup>1</sup> n = 1,879, unweighted data.

<sup>2</sup> n = 658, unweighted data.

<sup>3</sup> Valid percent for each food group.

\* Statistically significant at p < .05 based on weighted data.

### Belief in the Importance of Following Specific Dietary Recommendations

As shown in table 5, p. 10, respondents' beliefs in the importance of following specific dietary recommendations were similar in both income groups. In general, respondents from both income groups were less likely to believe it is important to choose a diet with plenty of breads, cereals, rice, and pasta than to follow other dietary recommendations. The only significant difference in beliefs occurred among the total sample and concerned whether it is important to eat at least two servings of dairy products daily. Forty-two percent of all low-income respondents believe that consuming at least two servings of dairy products daily is important, compared with 35 percent of all higher income respondents.

### Importance of Nutrition Compared With Other Product Attributes

Among respondents with children, the percentage who rated nutrition very

important compared with other product attributes was similar between income groups (see figure, p. 11). Sixty-four percent of low-income respondents and 66 percent of higher income respondents rated nutrition very important. Although nutrition was rated relatively high, it was not rated as high as several other product attributes.

Safety and taste were rated very important product attributes by a large percentage of respondents with children in both income groups. Significantly more respondents in the low-income group than those in the higher income group rated how well the food keeps, price, and ease of preparation as very important. Prior research has shown that single mothers, who generally belong to a low-income group, also valued these attributes more than married couples (12).

Also, single mothers shop less frequently (12). Less frequent shopping may be one of the reasons why low-income

respondents were more concerned than higher income respondents with how well the food keeps. Less frequent shopping may affect the types of foods that are purchased, especially fresh fruits and vegetables. As shown in table 1, low-income families with children were more likely to have a female head of household than were higher income families with children, so single mothers' shopping patterns may have a significant impact on the diets of low-income families with children.

The largest difference between income groups occurred in relation to the importance of price. Seventy-one percent of low-income respondents with children considered price very important, compared with 36 percent of higher income respondents with children.

A significantly higher percent of low-income than higher income respondents with children rated ease of preparation very important. A special analysis of



**Table 5. Respondents' belief in the importance of following specific dietary recommendations, DHKS 1994**

Dietary recommendation	All <sup>1</sup>		With children <sup>2</sup>	
	Low income	High income	Low income	High income
<i>Percent rating "Very important"<sup>3</sup></i>				
Use salt or sodium in moderation	52	56	47	53
Choose a diet low in saturated fat	56	57	46	52
Choose a diet with plenty of fruits and vegetables	67	68	61	63
Use sugars only in moderation	51	54	47	52
Choose a diet with adequate fiber	52	51	47	48
Eat a variety of foods	61	61	57	58
Maintain a healthy weight	74	75	71	76
Choose a diet low in fat	61	61	57	59
Choose a diet low in cholesterol	60	57	55	53
Choose a diet with plenty of breads, cereals, rice, and pasta	35	33	35	33
Eat at least two servings of dairy products daily	42*	35	44	40

<sup>1</sup> n = 1,879, unweighted data.

<sup>2</sup> n = 658, unweighted data.

<sup>3</sup> Valid percent for each recommendation.

\* Statistically significant at p < .05 based on weighted data.

the 1989-91 CSFII revealed that meal planners in food-stamp eligible households—those at or below 130 percent of the poverty threshold—spent more time preparing the main meal than higher income meal planners (19). Since low-income meal planners spend more time preparing the main meal, it is not surprising that ease of preparation is considered to be an important product attribute.

#### Use of Food Labels

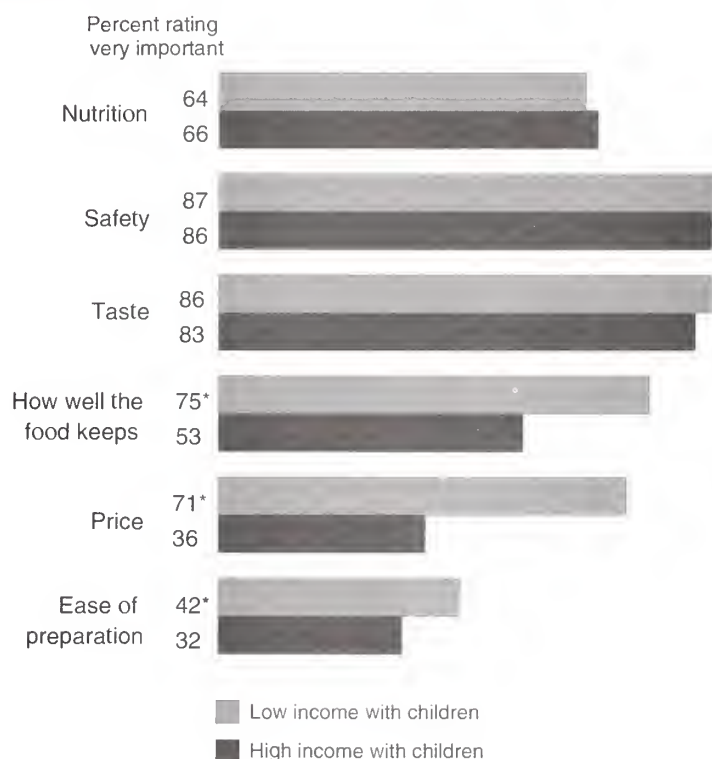
A relatively high percentage of respondents used the food label (table 6, p. 12). The Nutrition Labeling and Education Act of 1990 was implemented in 1994 (14) to make food labels that appear on packaged foods more understandable

and useful. However, the effects of this act are not fully reflected in the 1994 DHKS since survey data collection began before the law required implementation. Among respondents with children in the household, those with low income were significantly less likely than those with higher income to use the nutrition panel when buying foods. However, low-income respondents who generally used food labels when buying foods were as likely as other respondents to use the nutrition panel for specific nutrition information. Low-income respondents were significantly more likely to use the nutrition label for information about vitamins or minerals than were their higher income counterparts.

#### Frequency of Selected Eating Practices

Table 7, p. 13, presents the percent of respondents who reported "always" or "almost always" performing selected eating practices. Low-income respondents were significantly less likely to follow several lowfat and low-cholesterol eating practices. Low-income respondents with children were less likely to eat lowfat luncheon meats, to use skim or 1-percent milk, and more likely to eat fried chicken. The low-income group was also significantly more likely to eat chips four or more times a week and to consume eggs three or more times per week.

## Rating of importance of nutrition compared with other product attributes by DHKS respondents with children, 1994



**Low-income respondents were significantly less likely to follow several lowfat and low-cholesterol eating practices.**

\*Statistically significant at  $p < .05$  based on weighted data.

These same significant relationships held when all respondents were compared by income level. In addition, all low-income respondents were significantly less likely than all higher income respondents to remove skin from chicken and significantly more likely to have fruit for dessert.

### Conclusions

Results indicate that low-income respondents with children are less aware of diet-disease relationships, compared with higher income respondents with children. Although their beliefs in the

importance of nutrition are not significantly different from those of the higher income group, they were less likely to employ some lowfat and low-cholesterol eating practices. Low-income respondents with children were also less likely to use the nutrition panel when buying foods. However, low-income respondents who generally used the food label were as likely as other respondents to use the nutrition panel for specific nutrition information when buying foods.

Although low-income respondents with children in the household are as concerned about nutrition as higher income

**Table 6. Frequency of use of food labels overall, and by type of information by respondents, DHKS 1994**

Type of use	All <sup>1</sup>		With children <sup>2</sup>	
	Low income	High income	Low income	High income
<i>Percent answering "Sometimes or Often"<sup>3</sup></i>				
General use of nutrition panel when buying foods	61*	68	59*	71
For information about: <sup>4</sup>				
Calories	70	72	71	69
Total fat	73	75	69	70
Saturated fat	67	67	63	59
Cholesterol	67	71	64	68
Salt or sodium	68	65	66	59
Fiber	55	55	50	51
Sugars	64	62	61	57
Vitamins or minerals	70*	63	73*	62

<sup>1</sup> n = 1,879, unweighted data.

<sup>2</sup> n = 658, unweighted data.

<sup>3</sup>Valid percent for each type of use.

<sup>4</sup>The following subcategories of questions were asked only of those who indicated regular label use in the preceding question.

\* Statistically significant at p < .05 based on weighted data.

respondents with children, results show that they have many competing concerns that may hinder their ability to follow dietary recommendations. Food safety, taste, how well food keeps, and price were each rated very important by more low-income respondents with children than was nutrition. Given the importance low-income consumers place on these issues, nutrition education and promotion messages must be realistic about the limited means and competing concerns of low-income consumers.

Frazao and Allshouse (5) found that food products modified in fat, sodium, or other food constituents generally cost more than their standard counterparts. If consumers believe that dietary change

requires buying these modified foods, they will conclude that a diet that meets recommendations is more expensive than one that does not.

However, it is also possible to plan a healthful diet using standard food products that are naturally moderate in fat, saturated fat, and sodium—without additional cost (13). Professionals who work with low-income consumers can employ the use of sequential learning experiences to focus on promotional activities that show how to translate consumers' belief that nutrition is important into eating practices that are neither more time consuming nor more expensive. Messages encouraging specific practices, such as "remove

the skin from chicken," could help to lower fat intakes without any additional expense for the consumer.

The 1995 Dietary Guidelines for Americans emphasizes that children should begin gradually adopting a diet that contains not more than 30 percent of calories from fat between the ages of 2 and 5 years. This is the same percentage of calories from fat that an adult should consume.

Nutrition education messages for the low-income public should include an emphasis on children when applicable. A successful example of this type of behavioral focus that included an emphasis on children was the Lowfat Milk Campaign (30). The Lowfat Milk Campaign was a multifaceted social marketing campaign that promoted the use of lowfat milk in the low-income, inner-city, Latino community in New York City. Included in the target population for dietary change were children over the age of 2 years. The Campaign emphasized to parents that not only they but also their children who were over the age of 2 should be drinking lowfat milk. Between 1990 and 1992, the Lowfat Milk Campaign produced an increase in consumer demand for lowfat milk throughout the community without any added expense or effort for the consumer.

Results may have implications for nutrition education and promotion efforts that focus on the low-income population with children in the household. One of the largest and oldest of these efforts is USDA's EFNEP, which has provided in-depth nutrition education primarily to low-income households with children since 1969. A large proportion of these households—63 percent—receive food stamps (21).

**Table 7. Frequency of selected eating practices of respondents, DHKS 1994**

Practice	All <sup>1</sup>		With children <sup>2</sup>	
	Low income	High income	Low income	High income
<i>Percent answering "Always or Almost Always"<sup>3</sup></i>				
Eat lowfat luncheon meats instead of regular luncheon meats	16*	26	13*	24
Use skim or 1% milk instead of 2% or whole milk	23*	39	15*	33
Eat special, lowfat cheeses when you eat cheese	11	16	7	11
Eat ice milk, frozen yogurt, or sherbert instead of ice cream	16	19	11	12
Use low-calorie instead of regular salad dressing	23	29	17	24
Have fruit for dessert when you eat dessert	20*	14	16	12
Eat fish or poultry instead of meat	16	20	15	18
Add butter, margarine, or sour cream when eating baked or boiled potatoes	53	55	56	60
Eat other cooked vegetables with butter or margarine added	22	20	23	22
Eat other cooked vegetables with cheese or another creamy sauce added	2	2	3	2
Eat fried chicken	12*	4	14*	3
Remove the skin when eating chicken	44*	50	36	47
<i>Percent answering four or more times per week<sup>3</sup></i>				
Bakery products (cakes, cookies, or donuts)	17	18	15	17
Chips (potato or corn)	16*	11	19*	12
<i>Percent answering three or more times per week<sup>3</sup></i>				
Beef, pork, or lamb at main meal	48	45	56	48
Eggs	36*	27	42*	27

<sup>1</sup> n = 1,879, unweighted data.

<sup>2</sup> n = 658, unweighted data.

<sup>3</sup>Valid percent for each practice.

\* Statistically significant at p < .05 based on weighted data.

However, although EFNEP has been shown to be effective in improving diet quality among low-income consumers, only a small percentage of food stamp participants are involved in EFNEP. In addition, efforts are now underway to integrate nutrition education and promotion activities into the Food

Stamp Program. Such efforts could help "provide millions of low-income children and families with the skills, information, and motivation necessary to support healthful eating" (9). In addition, USDA's Team Nutrition, which provides nutrition education in the schools and the community to

motivate and empower children to make healthy food choices, should help to increase nutrition knowledge of all children (22). Given the role of nutrition in promoting early learning and lifelong health, the importance of this "healthy start" for children is considerable.

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# The Association Between Smoking and the Diet and Health Attitudes, Awareness, and Knowledge of Low-Income Parents

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Using USDA's 1989-90 Continuing Survey of Food Intakes of Individuals (CSFII) —Diet and Health Knowledge Survey (DHKS), this study examines the association between smoking and the diet and health attitudes, awareness, and knowledge among 302 low-income parents. Adjusting for race and female occupation, the parents who smoked 21+ cigarettes per day were significantly less likely to place importance on including nutrients and other dietary components needed for health in their diets than the parents who smoked 1-10 cigarettes per day ( $p < 0.05$ ). Race, female occupation, education level, and age were also related to parental diet and health attitudes, awareness, and knowledge.

**S** mokers are known to have fewer healthy behaviors than nonsmokers. For example, smokers are more likely to drink alcohol and less likely to get sufficient sleep and exercise than nonsmokers (17, 23). Research shows that, on average, the diet of smokers is of poorer quality than nonsmokers. For example, the consumption of fruits, vegetables, dietary fiber, and dairy products has been negatively associated with smoking (1, 10, 13-15, 18, 24). In addition, smokers have poorer scores when tested on their knowledge of

diseases or illnesses in comparison with nonsmokers (12). Hence, being a current smoker seems to negatively influence dietary intake and other health behaviors as well as knowledge concerning health and diet.

Income is negatively related to smoking (16). Thus, children residing in low-income households may be most apt to experience dietary differences associated with their parents' smoking status. We studied the association between parental smoking and the diet quality of children in low-income households

and found that parental smoking was positively associated with saturated fat, sodium, and total energy intake and negatively associated with vitamin A and fiber intake (11). Hence, children of heavy smokers in low-income households had diets that were farther away from contemporary dietary recommendations than did children of light or nonsmokers in low-income households.

Because of these findings, there is a need to examine why, in low-income households, children of heavy smokers have poorer diets than children of light or nonsmokers. The objective of this study was to examine the association between smoking and attitudes, awareness, and knowledge regarding diet among low-income parents in an attempt to explain how these factors might affect the diets of their children.

## Methods

### The Research Instrument

For almost 60 years, the U.S. Department of Agriculture (USDA) has been a monumental force in the monitoring of nutritional status and food intakes for the United States (20). The 1989 and 1990 USDA Continuing Survey of Food Intakes of Individuals (CSFII) examined the food intakes and dietary patterns of 7,677 persons in 2,947 U.S. households (26). USDA added the Diet and Health Knowledge Survey (DHKS) to the CSFII in 1989 to gather additional information concerning diet and health attitudes, awareness, and knowledge in an effort to examine how these factors may influence people's food choices (26).

The CSFII was designed to obtain a nationally representative sample of households in the 48 conterminous United States and consists of an all-income and a low-income sample. In the all-income sample, all households, including low-income households, were eligible to be interviewed. For the low-income sample, participation was limited to individuals in households with a gross income for the previous month at or below 130 percent of the Federal poverty thresholds.

For the CSFII, trained interviewers visited each household and obtained socioeconomic, demographic, health-related, and dietary intake data on households and their members. For the DHKS, one member of each CSFII household was contacted about 6 weeks after dietary data were collected. Ideally, the individual contacted was the person who had identified himself or herself as the household's main meal planner/preparer. In about 6 percent of the households, this person could not be contacted so the DHKS respondents were not the main meal planner/preparer.

### Selection of Sample

The sampling frame for this study consisted of parents of children age 17 and younger who were included in an earlier study using CSFII data that examined the association between parental smoking and children's diet quality in low-income households ( $n=515$ ) (11). Low-income was defined in the study sample as at or below 185 percent of the Federal poverty thresholds. This percentage was used because it is the cutoff for some government-sponsored food assistance programs,

such as WIC—the Special Supplemental Nutrition Program for Women, Infants, and Children and the reduced-price National School Lunch and School Breakfast Programs.

Eighty-nine percent of the sample ( $n=458$ ) from the earlier study also participated in the DHKS. The final sample ( $n=302$ ) consisted of only those parents who answered each of the attitude, awareness, and knowledge questions used in this study (see box, pp. 18-19). Sampling weights were not applied because the sample was a subsample derived from an earlier study (11). Thus, it cannot be assumed that the study results are generalizable to the entire U.S. population.

### Description of the Sample

The final sample of parents ( $n=302$ ) was 72 percent White, 23 percent Black, and 5 percent Other (Asian, Pacific Islander, Eskimo, American Indian). The mean annual household income was \$11,544 ( $\pm\$6,282$ ), and the mean percent of Federal poverty level was 94 percent ( $\pm 44$  percent). Thirteen percent of the sample was from the Northeast; 25 percent, the Midwest; 43 percent, the South; and 19 percent, the West. Thirty-seven percent of the sample resided in central cities; 37 percent, in suburban areas; and 26 percent, in nonmetropolitan areas. Ninety-two percent of the sample was female. The parents' ages ranged from 13 to 69 years old with a mean of 32.2 years ( $\pm 8.5$  years). The mean year for highest level of education attained by the respondents was 11.5 years ( $\pm 2.6$  years) with a range from second grade to more than 4 years of college. Thirty-five percent of the respondents received food stamps and 6 percent were WIC participants. The majority of the participants were service or clerical workers.

## Definition of Study Variables

### *Independent variable*

The independent variable was the average number of cigarettes smoked per day as self-reported by the sample parents. From this a five-category scale (never smoked, ex-smoker, 1-10, 11-20, or 21+ cigarettes per day) was devised.

### *Dependent variables*

The dependent variables were scales that were developed to measure diet and health attitudes, awareness, and knowledge using designated questions from the DHKS (8, 9). An Attitude 1, Attitude 2, Awareness, and Knowledge scale made up the four dependent variables. These scales, developed by Haines and colleagues, were derived to reflect the diet and health attitudes, awareness, and knowledge of the main meal planner in the household.

Ultimately, these scales were designed to help explain food choices among American households (8, 9). From these scales, attitudes regarding dietary guidance, diet-health perceptions or awareness, and nutrient composition knowledge were evaluated (8, 9). The Chronbach's alpha test was used as an index of reliability with a value of  $>0.60$  as a marker for acceptable values. Haines et al. tested the reliability of the scales using both the all-income and the low-income sample from the 1989 CSFII-DHKS and found all the scales to be acceptable (8).

The attitude scales were developed to measure attitudes toward dietary guidance (8, 9). The Attitude 1 scale included six questions that measured the importance of avoiding certain nutrients. A sample question was, "How important is it to you personally to avoid too much salt or sodium?" The score for each question ranged from a "one=not at all important"

## U.S. Department of Agriculture (USDA) 1989-1990 Diet and Health Knowledge Survey (DHKS)

### DHKS questions for the Attitude 1, Attitude 2, Awareness, and Knowledge scales

#### Attitude 1

On a scale from 1 to 6, please tell me how important it is to you personally to:

- Avoid too much salt or sodium.
- Avoid too much saturated fat.
- Avoid too much sugar.
- Drink alcoholic beverages in moderation if at all.
- Avoid too much fat.
- Avoid too much cholesterol.

Answers ranged from 1 ("not important at all") to 6 ("very important"). "Don't know" and "no answer" were also coded.

#### Attitude 2

On a scale from 1 to 6, please tell me how important it is to you personally to:

- Eat at least five servings a day of fruits and vegetables.
- Eat foods with adequate fiber.
- Eat foods with adequate starch.
- Eat a variety of foods.
- Eat at least six servings a day of breads, cereals, and other grain products.

Answers ranged from 1 ("not important at all") to 6 ("very important"). "Don't know" and "no answer" were also coded.

#### Awareness

Have you heard about any health problems that might be related to:

- How much fat a person eats?
- How much saturated fat a person eats?
- How much fiber a person eats?
- How much salt or sodium a person eats?
- How much calcium a person eats?
- How much cholesterol a person eats?
- How much sugar a person eats?
- How much iron a person eats?
- Being overweight?

Answers were 1 ("yes"), 2 ("no"), 8 ("don't know"), and 9 ("no answer").

**Knowledge**—The correct answer is noted in ( ) after each question.

Based on your knowledge, which has more fiber?

- |                                   |                |
|-----------------------------------|----------------|
| Fruit or meat?                    | (Fruit)        |
| Cornflakes or oatmeal?            | (Oatmeal)      |
| Whole wheat bread or white bread? | (Whole wheat)  |
| Orange juice or an apple?         | (Apple)        |
| Kidney beans or lettuce?          | (Kidney beans) |
| Popcorn or pretzels?              | (Popcorn)      |



**Knowledge (con't)**—The correct answer is noted in ( ) after each question.

**Ounce for ounce, which is highest in calories?**

Would you say butter, sugar, potatoes, or straight alcohol? (Straight alcohol)  
Which is next highest in calories? (Butter)

**Based on your knowledge which has more cholesterol?**

Liver or t-bone steak? (Liver)  
Butter or margarine? (Butter)  
Egg whites or egg yolks? (Egg yolks)  
Skim milk or whole milk? (Whole milk)

**Which has more fat?**

Regular hamburger or ground round? (Regular hamburger)  
Loin pork chops or pork spare ribs? (Pork spare ribs)  
Hot dogs or ham? (Hot dogs)  
Peanuts or popcorn? (Peanuts)  
Yogurt or sour cream? (Sour cream)  
Porterhouse steak or round steak? (Porterhouse)  
Ice cream or sherbet? (Ice cream)  
Roast chicken leg or fried chicken leg? (Fried chicken leg)

**What kind of fat is more likely to be a liquid rather than a solid?**

Saturated fats  
Polyunsaturated fats (Correct)  
Equally likely to be liquids  
Don't know  
No answer

**If a food is labeled cholesterol free, is it also?**

Low in saturated fat  
High in saturated fat  
Could be either high or low in saturated fat (Correct)  
Don't know  
No answer

**Is cholesterol found in?**

Vegetables and vegetable oil  
Animal products like meat and dairy products (Correct)  
All foods containing fat  
Don't know  
No answer

**Total possible correct answers was 23.**

to a "six=very important." A mean Attitude 1 score was calculated using the responses from the six Attitude 1 questions.

The Attitude 2 scale included five questions that measured the importance of including certain nutrients and dietary components in the respondents' diet (8, 9). A sample question was, "How important is it to you personally to eat foods with adequate fiber?" A score of one was given to the response "not at all important," and six points were given to the response "very important." A mean Attitude 2 score was calculated using the responses from the five Attitude 2 questions.

An Awareness scale was developed to measure diet and health awareness (8, 9). Questions included awareness of any diseases relating to certain nutrients. A sample question was, "Have you heard about any health problems that might be related to how much fat a person eats?" One point was given for a "yes" response and zero points for a "no" response. A mean Awareness score was calculated using the responses from nine questions. There was no correct or incorrect answer for these questions due to the fact that the scale was developed to determine the respondents' perceived awareness of whether there was a relationship (8, 9).

The Knowledge scale was developed to measure knowledge of nutrients and nutrient content in certain foods (8, 9). These questions focused on specific nutrients: Calories, fat, fiber, and cholesterol. A pair of foods was presented and the respondent had to choose which food had more of the particular nutrient in question. A sample question was, "Based on your knowledge, which has



**...heavy smoking was negatively associated with attitudes regarding the importance of including food and nutrients needed for a healthy diet.**

more fiber—fruit or meat?” Respondents were given one point for the correct answer and zero points for an incorrect answer. A mean Knowledge score was calculated using the responses from 23 knowledge questions.

#### **Control variables**

The potential control variables were selected based on their known association with smoking in other samples. These included the participants’ attained education level, occupation, total household income, percent of Federal poverty level, race, age, and gender (16, 25, 27, 28).

#### **Statistical Analysis**

The statistical relationships between smoking status and diet and health attitudes, awareness, and knowledge scores were assessed using the Statistical Analysis System (SAS) (22). Statistical significance was set at  $p \leq 0.05$ .

The relationships among the variables were assessed in three steps. First, the bivariate relationships between the independent variable (smoking status) and the dependent variables (diet and health attitudes, awareness, and knowledge scores) were analyzed using analysis of variance (ANOVA) and the Duncan’s multiple range test for variables. This was to establish any significant bivariate relationships among the variables before adjusting for the control variables.

Second, bivariate analyses were used (ANOVA and chi-square) to determine any relationships between the independent variable and the potential control variables (male and female education level, male and female occupation, total household income, percent of Federal poverty level, race, age, and gender) in order to determine potential confounding variables.

Third, a multivariate analysis, a combination of analysis of covariance (ANCOVA) and least-squares means comparisons, was used to determine the effect of smoking status on each dependent variable (Attitudes 1 and 2, Awareness, and Knowledge scores) while adjusting for those control variables that were significantly associated with smoking status in the sample (race and female occupation). Thus, race and female occupation were entered as control variables in the ANCOVA analysis to adjust for variations in the dependent variables that otherwise might be attributable to them. Additionally, simple regression, ANOVA and chi-square analysis were used to explore the relationships between all potential control variables and the dependent scale scores.

## **Results**

### **Scale Results**

The mean scores for the Attitude 1 and Attitude 2 scales were 4.6 ( $\pm 1.0$ ) and 4.5 ( $\pm 1.0$ ) respectively. A perfect score for either of these two scales was 6.0. These two scores show that the sample placed some importance on including or avoiding certain nutrients and food components in their diet. The mean score for the Awareness scale was 0.65 ( $\pm 0.29$ ) with a perfect score being 1.0. There was no correct or incorrect answer for the awareness questions. The score of 0.65 can be interpreted as the sample being somewhat aware of some nutrients related to various diseases. The mean Knowledge score was 15.0 ( $\pm 2.7$ ) with a perfect score being 23. This is equivalent to 65 on a 100-point scale and can be interpreted as the sample being somewhat knowledgeable about nutrients and nutrient content in certain foods.

**Table 1. Bivariate relationships between smoking status and four scale scores using ANOVA (n=302)\***

Scale scores	Nonsmoker (n=134)	Ex-smoker (n=31)	1-10 cigarettes/day (n=44)	11-20 cigarettes/day (n=65)	21+ cigarettes/day (n=28)	Overall F value	p value
Attitude 1	4.72 <sup>a</sup>	4.44 <sup>a</sup>	4.47 <sup>a</sup>	4.62 <sup>a</sup>	4.36 <sup>a</sup>	1.30	0.271
Attitude 2	4.57 <sup>a,b</sup>	4.41 <sup>a,b</sup>	4.70 <sup>a</sup>	4.46 <sup>a,b</sup>	4.16 <sup>b</sup>	1.49	0.206
Awareness	0.67 <sup>a</sup>	0.71 <sup>a</sup>	0.59 <sup>a</sup>	0.60 <sup>a</sup>	0.67 <sup>a</sup>	1.38	0.240
Knowledge	14.96 <sup>a</sup>	15.71 <sup>a</sup>	14.52 <sup>a</sup>	15.11 <sup>a</sup>	15.32 <sup>a</sup>	1.02	0.397

\*Results represent mean values.

Row means with the same superscript letter (a,b) are not significantly different using the Duncan's Multiple Range test.

### Bivariate Analyses

The bivariate relationships between the smoking status variables and the four dependent variables (Attitudes 1 and 2, Awareness, and Knowledge scales) are shown in table 1. Overall, there were no significant relationships between the independent variable and dependent variables. However, in the preplanned multiple comparison using Duncan's multiple range test for variables, significance was found within the smoking categories and the Attitude 2 scale (importance of including certain nutrients and dietary components in the diet) score. Those who smoked 1-10 cigarettes per day had a significantly higher Attitude 2 score than those who smoked 21 or more cigarettes per day.

Bivariate analysis was also used to test for any relationships between the independent variable (smoking category) and potential control variables. Only race ( $p=0.001$ ) and female occupation ( $p=0.012$ ) were found to be significantly related to smoking status. Whites had the highest percentage of current smokers, and Blacks had the highest percentage of nonsmokers. Among female occupations, the farmer/operators had the

highest percentage of current smokers, and the professional/ managers had the highest percentage of nonsmokers. Because of these associations, race and female occupation were controlled for in all further multivariate analyses.

### Multivariate Analysis

As shown in table 2, p. 22, when the effect of race and female occupation were held constant, the parents who smoked 1-10 cigarettes per day continued to have significantly higher Attitude 2 scale (importance of including certain nutrients and dietary components in the diet) scores than those who smoked 21 or more cigarettes per day.

### Other Findings

Since few relationships were found between smoking and the scale scores, the effects of the control variables were analyzed as well. Race and female occupation were examined to test their relationships with the four scale scores. Table 3, p. 23, shows the results from the ANCOVA with female occupation as the independent variable, adjusting for race and smoking categories and then using race as the independent variable, controlling for female occupation and smoking categories. Female occupation

was significantly related to Attitude 2 scores, Awareness scores, and Knowledge scores. A least-squares means comparison showed that the female occupation group, other (which included any occupations not included in the other occupation categories), had significantly lower Attitude 2 scores than the clerical/service or farmer/operator/craftsperson occupations. The professionals/managers had significantly higher Awareness and Knowledge scores than any of the other three occupation groups. Race was significantly related to Awareness scores and Knowledge scores with Whites having significantly higher Awareness scores than those in the Other race category (which included Asians, Pacific Islanders, Aleuts, American Indians, and Eskimos) and significantly higher Knowledge scores than Blacks.

Other potential control variables (education level and age) were also associated with the various scale scores. The level of education achieved was positively related to Knowledge ( $p=0.003$ ) and Awareness scores ( $p=0.0001$ ) and age was positively related to Knowledge scores ( $p=0.03$ ).

**Table 2. Least squares means comparison of scale scores by smoking status, controlling by race and female occupation using ANCOVA (n=302)\***

Scale scores	Nonsmoker (n=134)	Ex-smoker (n=31)	1-10 cigarettes/day (n=44)	11-20 cigarettes/day (n=65)	21+ cigarettes/day (n=28)	Overall F value	p value
Attitude 1	4.69 <sup>a</sup>	4.44 <sup>a</sup>	4.47 <sup>a</sup>	4.64 <sup>a</sup>	4.34 <sup>a</sup>	1.04	0.398
Attitude 2	4.54 <sup>a,b</sup>	4.41 <sup>a,b</sup>	4.74 <sup>a</sup>	4.43 <sup>a,b</sup>	4.15 <sup>b</sup>	1.93	0.076
Awareness	0.67 <sup>a</sup>	0.70 <sup>a</sup>	0.62 <sup>a</sup>	0.59 <sup>a</sup>	0.70 <sup>a</sup>	4.60	0.0002
Knowledge	15.01 <sup>a</sup>	15.62 <sup>a</sup>	14.72 <sup>a</sup>	14.95 <sup>a</sup>	15.31 <sup>a</sup>	3.14	0.005

\*Results represent mean values.

Row means with the same superscript letter (a,b) are not significantly different using the Duncan's Multiple Range test.

## Discussion

The chief finding of this study was that the low-income parents in this sample who were heavy smokers (21+ cigarettes per day) were significantly less likely to place importance on including nutrients and other dietary components needed for health (i.e., fiber) in their diets than light smokers (1-10 cigarettes per day). Other factors, such as female occupation, race, education level, and age were also found to be associated with the parents' diet and health attitudes, awareness, and knowledge.

Because the premise of the study was based on findings from an earlier study (11), the present study sample (n=302) was compared with the sample generated for our earlier study (n=515) for a number of characteristics including income levels, levels of urbanization, regional distribution, parental age, and years of parental education. The samples were found to be analogous. This was important because the parents in the present study were a subsample—those who answered all the attitude, awareness,

and knowledge questions used in this study—of the parents included in the earlier study (11). As no major socio-demographic differences were found between the two samples, it was assumed that the samples were comparable and that there was no reason to presume that the nonrespondents of the DHKS were different from the respondents with regards to the variables measured in this study.

Since this study found differences in diet and health attitudes between heavy and light smokers, it is meaningful to examine other differences that are known to occur between these groups. On average, heavy smokers take on a plethora of risky health behaviors in addition to smoking. Heavy smokers often incorporate a lifestyle consisting of a poor diet and sedentary activity levels (19). Studies have shown that heavy smokers have lower health-consciousness scores than light smokers (2). Heavy smokers are less likely to be employed, have less education, and are less confident of their ability to quit than light smokers (29).

Thus, past research has shown that there are significant differences between light and heavy smokers and that heavy smokers assimilate more risk-taking behaviors than those who smoke less. This may help explain the primary finding in this study that heavy smokers had poorer attitudes toward the inclusion of certain foods and nutrients needed for a healthy diet than did light smokers.

In low-income households, parental smoking is negatively associated with children's diet quality. Specifically, children of heavy smokers (21+ cigarettes per day) in low-income households were found to consume more energy, saturated fat, and sodium and less vitamin A than the children of parents who smoked 1-10 cigarettes per day (11). This provides a meaningful link with the present study because it demonstrates that low-income parents who are heavy smokers may convey their poorer attitudes about the importance of incorporating healthy foods in the diet to their children, possibly resulting in poorer quality diets.

**Table 3. Least squares means comparison of scale scores by female occupation (controlling for race and smoking status) and by race (controlling for female occupation and smoking status) (n=302)\***

Scale scores	Female occupation				F value	p value
	Professional/managerial (n=28)	Clerical/service (n=165)	Farmer/operator (n=32)	Other (n=68)		
Attitude 1	4.89 <sup>a</sup>	4.63 <sup>a</sup>	4.71 <sup>a</sup>	4.56 <sup>a</sup>	0.63	0.680
Attitude 2	4.57 <sup>a,b</sup>	4.79 <sup>a</sup>	4.79 <sup>a</sup>	4.15 <sup>b</sup>	2.39	0.040
Awareness	0.88 <sup>a</sup>	0.65 <sup>b</sup>	0.68 <sup>a,b</sup>	0.57 <sup>b</sup>	6.23	0.001
Knowledge	17.21 <sup>a</sup>	14.92 <sup>b</sup>	14.13 <sup>b</sup>	14.90 <sup>b</sup>	4.45	0.001

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Scale scores	Race			F value	p value
	White (n=218)	Black (n=68)	Other (n=16)		
Attitude 1	4.59 <sup>a</sup>	4.75 <sup>a</sup>	4.91 <sup>a</sup>	0.60	0.664
Attitude 2	4.59 <sup>a</sup>	4.40 <sup>a</sup>	4.35 <sup>a</sup>	2.10	0.084
Awareness	0.70 <sup>a</sup>	0.60 <sup>a,b</sup>	0.48 <sup>b</sup>	6.10	0.001
Knowledge	15.63 <sup>a</sup>	13.71 <sup>b</sup>	15.10 <sup>a,b</sup>	4.84	0.001

\*Results represent mean values.

Row means with the same superscript letter (a,b) are not significantly different using the Duncan's Multiple Range test.

In addition to smoking status, other notable associations were found between the control variables and the scale scores. Specifically, female occupation, race, educational attainment, and age were related to Attitude 2, Awareness, and Knowledge scores. Other research supports the role some of these variables play in health behaviors and lifestyle.

A study measuring health knowledge found that race was a strong predictor of knowledge concerning the health consequences of smoking, with Blacks demonstrating significantly less health knowledge than Whites (12). Health knowledge also increased as the level of education and income increased (12). Age has been associated with the health beliefs and health behavior of adults

age 50 to 89 years, with those adults age 50 to 69 showing more positive health behaviors than adults age 70 to 89 (5).

According to the Health Belief Model, diverse variables contribute to people's health-related behaviors (6). In this sample, associations between knowledge, attitudes, or awareness towards diet and health were found with various social and demographic factors (smoking status, occupation, race, educational attainment, and age). Researchers have shown that diet and health knowledge, as measured by the 1989 DHKS, was an important predictor of overall nutrient adequacy in a large sample (n=508) of female heads of households (21).

Others have shown that knowledge of serving recommendations was positively associated with food group consumption (7). Thus, interventions designed to improve diet and health knowledge that are targeted to groups with lower knowledge scores (in this sample: All occupations other than professional/managers, Blacks, young adults, and people with low education levels) could lead to more informed decisions and an improvement in diet quality.

It is important to point out, however, that altogether few differences in the diet and health attitudes, awareness, and knowledge among smokers, ex-smokers, and never smokers were found in this study. Although it has been established



that, in general, smokers have diets of poorer quality than nonsmokers (1, 10, 13-15, 17, 18, 24), it is plausible that those factors measured using the scales developed from the DHKS did not substantially impact the food choices and dietary intake of these smokers. Thus, future research should be targeted towards elucidating other factors that may help explain the variation found in dietary intake among nonsmokers, light and heavy smokers, and their children.

This research has important implications for public policy. Approximately 28 million low-income Americans are receiving food stamps and about 6.3 million low-income American women and children are served by WIC (3). The cost to the USDA for these programs approached \$32 billion in 1995 (4). With all the public dollars focused on improving the health and nutritional status of the low-income population, efforts should be made to target low-income smokers, especially heavy smokers.

This study found that heavy smoking was negatively associated with attitudes regarding the importance of including food and nutrients needed for a healthy diet. We previously found that, on average, the children of heavy smokers had poorer diets than the children of parents who only smoked 1-10 cigarettes per day as well as nonsmokers (11). It is plausible that the heavy smokers conveyed their poorer diet and health attitudes to their children. Hence, programs designed to encourage smoking cessation and positive health behavior changes in low-income parents may not only prevent illness in the parents but may lead to positive nutrition benefits for their children as well.

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# A Methodology to Price Foods Consumed: Development of a Food Price Database

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Information on what people eat and how much money they spend on the foods they eat is useful when studying the cost of nutritious diets. USDA's Continuing Survey of Food Intakes by Individuals is a major source of information on food consumed by Americans. However, this survey lacks information about the cost of individual food items that are reported consumed by individuals. A methodology was developed to estimate the prices of foods as consumed in the survey: (1) The foods were disaggregated into their recipe ingredients; (2) the recipe ingredients were converted to a form that could be purchased; (3) the ingredients were priced; and (4) the ingredients were aggregated back to foods—with prices.

**T**he Continuing Survey of Food Intakes by Individuals (CSFII 1989-91), conducted by the U.S. Department of Agriculture (USDA), has information on the kinds and amounts of foods reported consumed by individuals. However, information on the cost of individual food items purchased and brought into homes is not available in this survey. Therefore, it is not possible to estimate how much individuals spend on foods they consume from the survey data alone. This article describes the methodology that was developed to estimate the prices of foods as reported consumed in the survey and the Food Price Database that resulted.

## Sources of Data

The process of food price database development involved the identification of foods reported consumed in the CSFII 1989-91 survey and their recipe ingredients, conversion of recipe ingredients to the form in which they can be purchased, pricing of recipe ingredients, and converting the recipe ingredients with prices to foods reported consumed with prices. Various data sources were used in the different steps of developing the database; these are listed on the opposite page.

### Identification of foods reported consumed and their recipe ingredients.

- USDA Continuing Survey of Food Intakes by Individuals 1989-91—"Record Type 30" (4). This file lists individual foods reported consumed in the survey. Food intake data were obtained for individuals age 1 year and older.
- USDA Continuing Survey of Food Intakes by Individuals 1989-91—"Survey Recipe File" (5). This file contains recipes for all the foods reported consumed in the survey. Each food is identified by a 7-digit food code. Table 1 gives some of the information from the survey recipe file for chili con carne with beans and potato salad with egg. Only those recipes for the foods reported consumed on the first day of the survey by individuals age 1 year and older were used.

### Conversion of recipe ingredients to the forms in which they can be purchased.

- USDA Agriculture Handbook No. 102—"Food Yields Summarized by Different Stages of Preparation" (2). This publication contains the percent yield of foods. For example, it was used to compute the percent of edible portion of a vegetable after it is peeled and percent yield of some cooked foods.
- USDA Agriculture Handbook No. 8 (series)—"Composition of Foods" (3). Information from Handbook No. 8 was used to compute the weight of uncooked foods such as pasta, rice, meat, and vegetables from the respective cooked weights.

**Table 1. Recipes for chili con carne with beans and potato salad with egg**

Survey food code	Ingredient description	Amount in 100 grams of recipe
<b>Food: Chili con carne with beans</b>		
2711141	Ground beef, cooked	20.92
2711141	Onion, raw	6.76
2711141	Celery, raw	3.69
2711141	Chili powder	.32
2711141	Salt	.34
2711141	Tomatoes, stewed	27.89
2711141	Tomato sauce	13.94
2711141	Kidney beans, canned	26.14
<b>Food: Potato salad with egg</b>		
7160101	Mayonnaise	8.12
7160101	Dry mustard	.24
7160101	Salt	.61
7160101	Onion, chopped	1.48
7160101	Green pepper, chopped	1.30
7160101	Celery, chopped	6.64
7160101	Sweet pickle relish	2.95
7160101	Pimento, canned	1.14
7160101	Potatoes, boiled, diced	66.45
7160101	Eggs, hard cooked, diced	11.07

- USDA Continuing Survey of Food Intakes by Individuals 1989-91—"Survey Food Code Book" (6). The survey food code book has gram weights for different measures such as cups, fluid ounces, slices, and units. This file was mainly used to convert fluid ounces to gram weight equivalents for foods such as milk, fruit juices, juice drinks, and salad dressings. The gram weight of measures for some of the foods are in table 2, p. 28.

### Pricing of food ingredients.

- Average retail prices for the food ingredients were assigned by USDA's Economic Research Service (ERS) (7). ERS used the following price sources to compute the food prices: Scantrack® system developed by A.C. Nielsen; Bureau of Labor Statistics (BLS), U.S. Department of Labor; Agricultural Marketing Service (AMS), USDA; and National Marine and Fisheries Service (NMFS), U.S. Department of Commerce.

**Table 2. Food codes, their descriptions, measures, and weights**

Survey food code	Food code description	Measure	Gram weight equivalent
1111100	Milk, cow's, fluid, whole	1 cup 1 fl oz	244 30.5
8310100	Blue or roquefort cheese dressing	1 cup 1 tbsp	245 15.3
8210200	Corn oil	1 cup 1 tbsp	218 13.6
8310710	Mayonnaise, made with yogurt	1 cup 1 tbsp	220 13.8
9241031	Soft drink, cola-type	1 fl oz 1 can (12 fl oz)	31 369
9241061	Ginger ale	1 fl oz 1 can (12 fl oz)	30 366
9251015	Apple juice drink	1 cup 1 fl oz	250 31.3
9251061	Fruit drink (includes fruit punches and fruit ades)	1 cup (8 fl oz) 1 fl oz	248 31.0

BLS collects a representative sample of retail prices in 85 urban areas throughout the Nation. Although the BLS prices are considered the best source of representative prices, they include only a limited number of foods.

The Scantrack® system has information on all scannable products in grocery stores having annual sales of a least \$2 million, which account for about 82 percent of all grocery sales. It provides such information as brand names and container sizes. AMS prices were used to compute the prices of fresh fruits and vegetables that were not available in the BLS and the Scantrack® databases. Data from NMFS were used to compute the prices of fresh fish and fish products that were not available in the BLS and the Scantrack® databases (1).

## Methodology

### Identification of Foods Reported Consumed and Their Recipe Ingredients

Foods reported consumed in the CSFII 1989-91 by individuals age 1 year and older were identified from the Record Type 30. Alcoholic beverages were not included because they are not a part of the Food Guide Pyramid food groups.

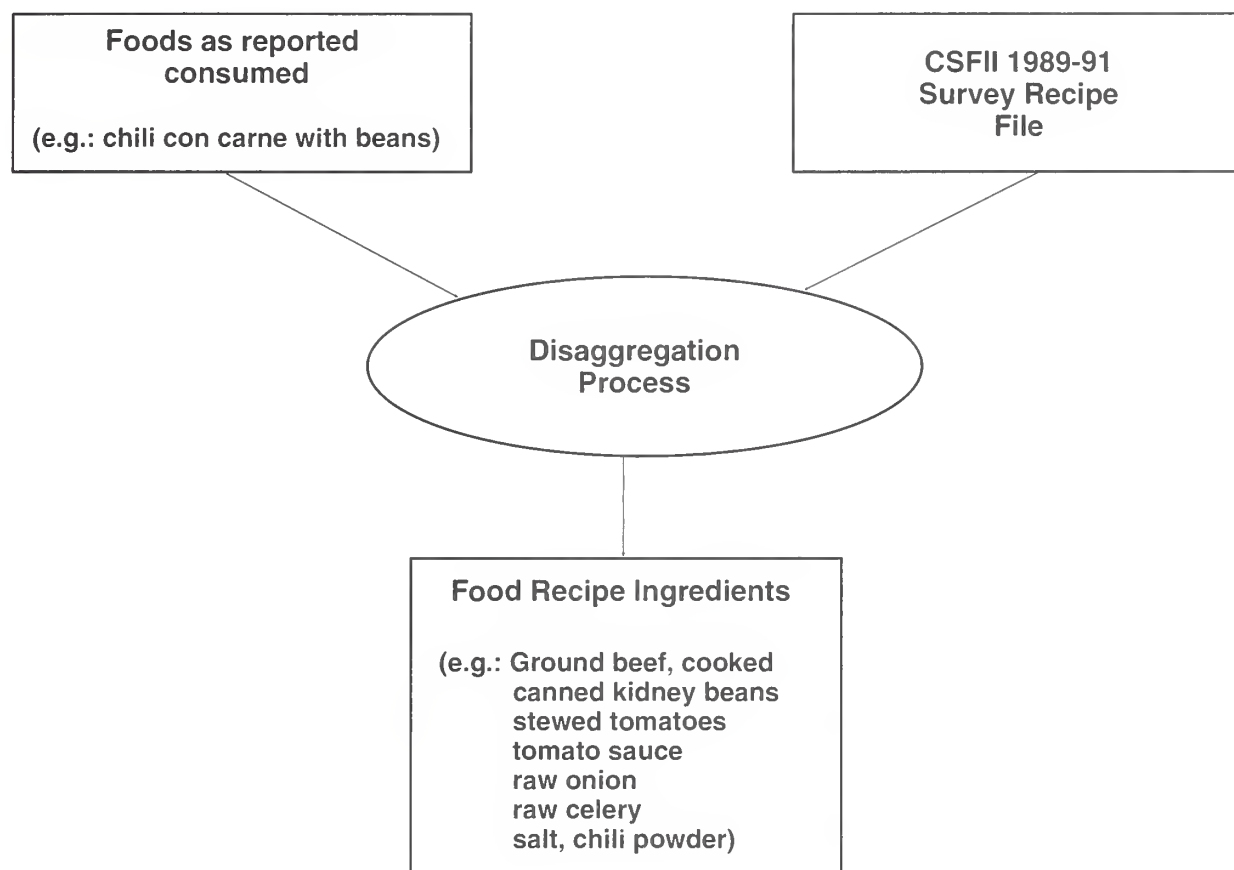
Recipes for the foods reported consumed were extracted from the CSFII 1989-91 survey recipe file. The names of the recipe ingredients, their amounts in the recipe, and the yield of the recipe were used to estimate prices of the foods reported consumed. Recipe ingredients were identified through a disaggregation process. Figure 1 shows the disaggregation of chili con carne with beans.

### Establishing the "Purchased" Form of Recipe Ingredients

Recipe ingredients that could be purchased in the form used in the recipes were separated from the other ingredients. These were ready for pricing. Most ingredients were in this form. Examples of such foods are milk, yogurt, cheese, butter, cream, breads, muffin, flour, ready-to-serve soups, baby foods, oils, salad dressings, soft drinks, ready-to-eat cereals, cookies, crackers, candies, luncheon meats, sausages, salt, and spices.

A recipe where all ingredients could be directly purchased is given in table 3, p. 30. The dry potato flakes, milk, margarine, and salt in the recipe for mashed potatoes may be purchased in the form required by the recipe. Recipe ingredients such as cooked rice, cooked pasta,

**Figure 1. Disaggregation of foods reported consumed to recipe ingredients**



boiled eggs, and steamed vegetables that could not be purchased in the form used in the recipes were converted back to the weight equivalents of the form in which they can be purchased, using conversion factors. A process to decide the need for conversion factors is shown in figure 2, p. 31.

#### **Development of Conversion Factors**

Two types of conversion factors were used: to adjust for cooking loss or gain and to adjust for food preparation waste. The first conversion factor adjusted for the loss or gain in weight

due to cooking. For example, steamed vegetables were converted to raw, prepared forms; and cooked rice and cooked pasta were converted to their respective uncooked forms. Some examples of this type of conversion—from cooked to raw forms—are shown in table 4, p. 30. By using a conversion factor, 100 grams of cooked rice was converted to 35.4 grams of uncooked rice by weight and assigned the price of this quantity of uncooked rice. In the same way, 100 grams of toasted white bread was assigned the price of 111 grams of fresh white bread.

The second conversion factor adjusted for waste in food preparation. This factor converted peeled raw potatoes to potatoes with peel and raw eggs to shell eggs. Examples of how the food preparation loss factor is used are given in table 5, p. 30. One-hundred grams of raw banana consumed is equivalent to 154 grams of raw banana with peel, and 100 grams of peeled, seeded, and sliced honeydew is equivalent to 217 grams of fresh whole honeydew. These fruits are priced as banana with peel and whole honeydew, respectively.



Some foods required conversion factors for both cooking weight changes and preparation waste. Foods such as fresh vegetables, eggs, meat cuts with bone and/or skin removed are first prepared to the form required for cooking and then cooked. Examples of foods that need both types of conversion factors are shown in table 6, p. 32.

### Pricing of Food Ingredients

National average prices for the food ingredients in “purchased” form for the years 1989, 1990, and 1991 were computed by ERS based upon data from Scantrack®, BLS, AMS, and NMFS (7).

ERS categorized nearly one-half million items from Scantrack® to fit into the CSFII food descriptions. Summary information was entered on a spreadsheet and average prices were computed. ERS made adjustments to the wholesale prices of fresh fruits and vegetables obtained from the AMS to account for losses due to trimming, spoilage and other damage, and to include the marketing spread (difference between wholesale and retail price, including transportation costs) to get retail prices. NMFS has developed a model that uses fish supply data and wholesale value information to estimate retail prices of most frequently consumed fish and shellfish. Prices for less frequently consumed fish were estimated using prices for similar species (1).

The prices received from ERS were in dollar amounts per pound or per fluid ounce. It was necessary to convert pounds and fluid ounces to corresponding gram weights. The CSFII 1989-91 Survey Code Book and Survey Recipe File, together with supermarket product label information, were used to convert fluid ounces to gram weights. All food prices were then converted to prices per 100 grams of food.

**Table 3. Example of a recipe where all the ingredients could be purchased**

Food ingredient	Amount in 100 grams of recipe	Raw weight equivalent
<i>Grams</i>		
<b>Food: Mashed potato made from potato flakes and milk</b>		
Dry potato flakes	14.5	14.5
Whole milk	23.2	23.2
Margarine	5.4	5.4
Water	56.4	56.4
Salt	0.5	0.5

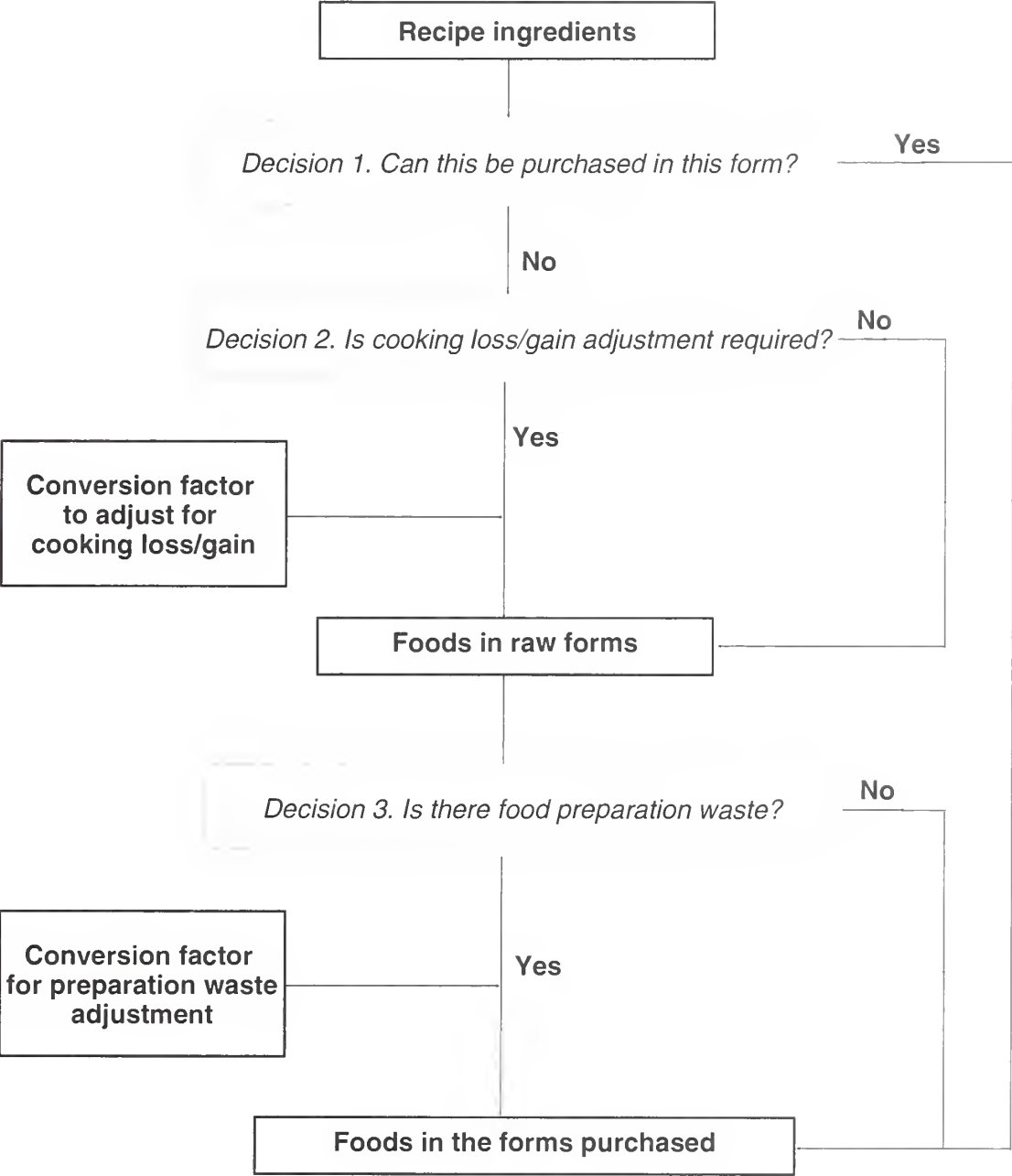
**Table 4. Examples of foods that gain or lose weight during cooking**

Food ingredient	Amount in 100 grams of recipe	Conversion factor	Raw weight equivalent
<i>Grams</i>			<i>Grams</i>
<b>Food: Cooked white rice, fat not added in cooking</b>			
Enriched cooked rice	99.12	0.36	35.40
Salt	0.88	1.00	0.88
<b>Food: White bread, toasted</b>			
Toasted white bread	100.00	1.11	111.0

**Table 5. Examples of foods that need adjustment for food preparation waste**

Food ingredient	Amount in 100 grams of recipe	Conversion factor	Raw weight equivalent
<i>Grams</i>			<i>Grams</i>
<b>Food: Raw banana</b>			
Raw banana, peeled	100	1.54	154
<b>Food: Honeydew melon</b>			
Honeydew melon, sliced	100	2.17	217

Figure 2. Decision process for establishing conversion factors



In the absence of food expenditure information, the Food Price Database offers a way to price the foods.

**Table 6. Examples of foods that need two conversion factors**

Food ingredient	Preparation waste conversion factor	Cooking gain/loss conversion factor
Cooked snap beans	1.14	1.11
Boiled carrots	1.12	1.03
Baked potato flesh	1.33	1.17
Boiled eggs	1.18	1.03
Roasted boneless chicken	1.49	1.19

**Table 7. Creating foods with prices—price of 100 grams of scrambled eggs**

Food ingredient	Raw equivalent in 100 gram recipe	Price of 100 gram ingredient	Price of recipe amount
	<i>Grams</i>	<i>Dollars</i>	<i>Dollars</i>
Raw eggs	87.57	\$0.16	\$0.140
Milk	31.64	0.06	0.019
Table fat	3.74	0.14	0.005
Salt	0.31	0.06	0
Total price of 100 grams of scrambled eggs = \$0.164			

Prices were obtained from ERS for about 1,600 foods. There were some foods in the survey for which ERS had no prices. The mean intake of these foods was very small in the survey. In these cases, average prices of similar types of foods that were available from ERS were used.

#### **Estimation of Prices for CSFII 1989-91**

The food ingredients were then aggregated back to foods in the form reported consumed in the CSFII. Each food had three prices—one for each year (1989, 1990, and 1991). Prices were computed for 100 grams of recipe. An example of how scrambled eggs is priced from its recipe ingredients is shown in table 7.

The final food price database contains 7-digit food codes for the foods and prices for 100 grams of each food for the years 1989, 1990, and 1991.

#### **Uses of the Food Price Database**

This database was developed to revise the current Thrifty Food Plan (TFP). The TFP is the lowest cost food plan developed by USDA and is the nutritional basis of U.S. Food Stamp Program benefits. The Food Stamp Program provides low-income households with the means to purchase low-cost, nutritious diets. In the current TFP, the cost of foods purchased by the low-income population was derived from the Household Survey data collected in

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the 1977-78 Nationwide Food Consumption Survey. The CSFII 1989-91 did not collect household food use data. In the absence of food expenditure information, the Food Price Database offers a way to price the foods. The primary use of this database is to study the cost of nutritious diets such as the USDA food plans.

### Acknowledgment

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## Children's Diets

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Many nutritionists believe that food preferences and dietary habits are formed during early childhood (1, 2). Good food habits formed early can continue into adulthood, thereby preventing or delaying the onset of a number of chronic diseases and conditions, such as high cholesterol and high blood pressure. The prevention of premature mortality and morbidity translates into lower health care costs (1).

Nationwide surveys of children's diets, such as the 1994 Continuing Survey of Food Intakes by Individuals (CSFII) and the 1988-91 National Health and Nutrition Examination Survey (NHANES III), indicate that children are doing poorly in meeting the Dietary Guidelines for Americans (the Guidelines apply to children 2 years of age and older). The typical diets of U.S. children exceed the recommendations for fat, saturated fat, and sodium; the percentage of children exceeding the Dietary Guidelines for Americans ranges from 58 to 91 percent for Non-Hispanic White, 55 to 89 percent for Non-Hispanic Black, and 62 to 94 percent for Hispanic for these three components.<sup>1</sup> Since the early 1970's, the prevalence of overweight among adolescents has increased from 1 in 7 to 1 in 5. It is unlikely that the U.S. Department of Health and Human Services'

<sup>1</sup>Dietary Guidelines specify no more than 30 percent calories from fat, 10 percent calories from saturated fat, and 2,400 mg sodium (3).

"Healthy People 2000" goal for fat and saturated fat will be achieved among children by the year 2000<sup>2</sup> (3).

Eating patterns have changed greatly over the past two decades. Between-meal snacks are accounting for an increasing proportion of children's nutrient intake (3). Most children consume snacks two or three times a day, with salty/crunchy foods and ice cream selected most often. Taste was reported by 80 percent of children as the most influential factor in their snack choice (1).

Another change in eating patterns concerns location—more eating occasions occur away from home now than a generation ago. Among surveyed families with children, 90 percent had eaten away from home during the previous week, and 50 percent had eaten away from home the previous day (1). Nearly half of family food expenditures were for food and drinks consumed outside the home, with one-third of the total food dollar spent on fast foods (1). Even when families do sit down together for a meal at home, they are often eating "carry-out" or other convenience foods prepared elsewhere.

<sup>2</sup>Objective 2.5 states: Reduce dietary fat intake to an average of 30 percent of energy or less and average saturated fat intake to less than 10 percent of energy among people age 2 years and older (3).



Children's diets are affected not only by other family members, but also by caregivers. As increasing numbers of women enter the work force, children spend more of their mealtimes with caregivers. Children's food intake can also be influenced by their peers and by advertising messages. Unfortunately, over half of food advertising on children's television is for foods that are high in fat, oil, and sugar (1). More and more, children make their own decisions about what they will eat, thanks to the availability of convenience foods, single-serve items, and microwavable entrees (1).

Racial and ethnic differences account for some of the variation in children's food intake and nutritional status. Compared with other racial/ethnic groups, Black children have higher total fat, saturated fat, cholesterol, and sodium intakes and lower vitamin A intakes (1). Black and Hispanic children were also found to have slightly lower levels of energy intake than White, non-Hispanic children (3).

In order to get the necessary energy, protein, vitamins, minerals, and fiber to ensure good health, the Dietary Guidelines advise eating a variety of foods. The focus of this study was to report the percentage of children who do or do not consume food from various Food Guide Pyramid food groups.

## Method

Data are from the 1994 Continuing Survey of Food Intakes by Individuals (CSFII), conducted by the Agricultural Research Service, U.S. Department of Agriculture. The survey collected data on the eating habits of over 5,500 participants who recalled food intake information for 2 nonconsecutive days

(5). Tables generated for the 1994 CSFII are based on intake data from Day 1 of the survey.

Because the sample size for children under age 1 was too small to ensure statistical reliability of the estimates, only children ages 1 to 19 were studied (5). Children ages 1 and 2 were combined in the 1994 CSFII. Therefore, even though Food Guide Pyramid recommendations apply to children age 2 and older, findings reported here include 1-year-olds. This analysis was based on CSFII Data Table #10, which was consolidated to include major food groups only.

## Results

The Food Guide Pyramid provides recommendations for children age 2 years and older on how much to eat from each of five major food groups to ensure that nutritional needs are met, without exceeding caloric needs. Preschool children need the same variety of foods that older children need, although their portion sizes can be smaller (6).

Although there are no Federal guidelines for optimal fiber for children (4), the Food Guide Pyramid recommends six servings of grain products per day for children. On the day of the survey, nearly every child over the age of 1 ate food from the grain group (see table, p. 36), which includes bread, cereal, rice, and pasta.

Fiber can also be found in fruits and vegetables. Higher intakes of fruits and vegetables are often associated with a lower risk of cancer and coronary heart disease. Although many children are aware of the relationship between diet and health, this knowledge does not

always affect their behavior or attitudes toward food (4). Children are very likely to consume fewer than the recommended number of servings from the fruit group and vegetable group (3). Other studies report that children consume only about half the daily recommended number of servings (4).

Although the Food Guide Pyramid recommends three to five servings from the vegetable group each day (6), between 19 and 24 percent of children ages 1 to 5 consumed no vegetables on the day of the survey. Among those ages 6 to 11, 17 percent (females) and 18 percent (males) consumed no vegetables, whereas among those ages 12 to 19, 22 percent (females) and 25 percent (males) consumed no vegetables. For many children, fried potatoes may have been the only vegetable consumed—between 29 and 38 percent of children ate fried potatoes that day, including French fries, home fries, and potato chips.

The Food Guide Pyramid recommends two to four servings per day from the fruit group (6). Even though children reported liking fruits more than vegetables (2), between 32 and 56 percent of 3- to 19-year-olds consumed no fruit on the day of the survey. Children ages 1 to 2 were more likely to eat fruit than older children probably because of the popularity of fruit baby food—78 percent ate fruit on the day of the survey.

A recent review of current intake data shows that calcium intake needs to be increased among children over age 6. Most teenagers, particularly females, do not consume 100 percent of their Recommended Dietary Allowance for calcium (4). Although children over the

**Food intakes: Percentage of children consuming foods from the Food Guide Pyramid food groups, by sex and age, 1 day, 1994**

Food Guide Pyramid Groups	Sex and age (years)					
	Both genders		Males		Females	
	1-2	3-5	6-11	12-19	6-11	12-19
Grain products	98.7	99.5	98.5	98.4	99.8	97.2
Vegetables	75.7	81.3	82.4	74.9	82.9	78.5
Fruits	78.3	67.8	59.8	44.0	59.3	47.1
Milk and milk products	94.2	92.3	93.7	80.3	91.2	77.1
Total fluid milk	88.4	84.3	80.2	57.3	77.0	52.3
Meat, poultry, fish, total	79.8	86.4	89.2	85.5	88.4	80.2
Eggs	24.2	17.1	17.1	16.5	14.3	15.6
Legumes	14.0	10.5	10.9	10.7	14.4	13.0
Nuts and seeds	13.5	19.3	20.1	9.0	14.4	6.7
Fats and oils	34.8	43.8	47.8	42.0	51.0	42.9
Sugars and sweets	42.4	56.7	56.8	46.3	58.0	52.3

Source: USDA Continuing Survey of Food Intakes by Individuals, 1994.

age of 1 are more likely than adults to consume fluid milk, consumption is low for teenagers. On the day of the survey, 43 percent of teenage males and 48 percent of teenage females consumed no fluid milk, although they may have been able to meet the Food Guide Pyramid's recommended three servings per day by eating other foods from the milk group, such as cheese or yogurt. When milk and milk products are summed, consumption of at least one item rose to 80 percent for teen males and 77 percent for teen females.

The Food Guide Pyramid recommends two to three daily servings from the meat group (poultry, fish, dry beans, eggs, and nuts are also included) (6). Although about the same percentage of 6- to 11-year-old males and females ate food from the meat group, teen males (ages 12 to 19) were more likely than

teen females to eat foods from this group (86 percent vs. 80 percent). Children ages 1 to 2 were more likely (24 percent) to consume eggs, followed by those ages 3 to 5 and males ages 6 to 11 (17 percent each). Females ages 6 to 11 were the least likely group to eat eggs (14 percent).

The foods at the top of the Food Guide Pyramid—fats and oils, sugars and sweets—were also reported in the CSFII. Most people should use these foods sparingly because they provide calories, but few vitamins and minerals (6). Females ages 6 to 19 were slightly more likely than their male counterparts to eat fats and oils and sugars and sweets. Also, children ages 3 to 5 were more likely to eat from these foods than children ages 1 to 2.

## Conclusions

Unfortunately, many children lack a sense of urgency about healthful eating and do not put into action what they know about nutrition. Many nutritionists are concerned about children's snacking behavior and the increasing proportion of calories and nutrients obtained from snacks. Lowfat and low-salt snacks should be encouraged, along with eating more fruits and vegetables for snacks. Children's eating habits are mainly influenced by their family, by institutions and programs, by the media, and by their peers (1). Healthy eating among our youth may best be achieved by promoting consistent nutrition messages from all sources that affect their eating behavior.

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### U.S. Per Capita Food Consumption

The U.S. Department of Agriculture's Economic Research Service (ERS) estimates per capita food consumption based on food disappearance data. These data represent the amount of food available for human use and are used as a proxy to estimate human consumption. The data may overstate what is actually eaten because they represent food supplies available in the market and do not account for waste.

Diet and health concerns, as well as changing relative prices and increasing real (adjusted for inflation) disposable income, have contributed to changes in U.S. food consumption. New products—particularly more convenient ones—have also influenced consumption, as have the aging population, expanded advertising campaigns, smaller households, more two-earner households, more single-person households, and an increasing proportion of ethnic minorities in the U.S. population.

The American diet has changed considerably over the past decade. Per capita beef consumption fell 14 percent between 1980-84 and 1990-94, while chicken consumption rose 37 percent and turkey, 67 percent. Egg use declined while cheese consumption increased. Consumption of fresh produce reached a record-high level in 1994.

### Meat Consumption

In 1994, total meat consumption (red meat, poultry, and fish) reached a record 194 pounds (boneless, trimmed equivalent) per person, 14.5 pounds above the 1980-84 annual average (see table). Americans consumed an average of 64 pounds of beef (boneless, trimmed equivalent), 49.5 pounds of pork, 49.5 pounds of chicken, 15 pounds of fish and shellfish, 14 pounds of turkey, and about 1 pound each of lamb and veal. Projections indicate that annual per capita meat consumption in 1996 may reach 200 pounds.

Red meat—beef, pork, lamb, and veal—accounted for 59 percent of the total meat supply in 1994, compared with 69 percent in 1980-84 and 74 percent in 1970-74. Chicken and turkey accounted for 33 percent of the total meat consumed in 1994, up from 24 percent in 1980-84 and 19 percent in 1970-74. In 1994, per capita consumption averaged 16 pounds less red meat, 30 pounds more poultry, and 3 pounds more fish and shellfish than in 1970-74.

In 1996, per capita consumption of beef, pork, chicken, and turkey will likely increase to match record-large production of livestock meat and poultry. Yearly changes in consumption are more likely due to changes in supply rather than changes in consumer tastes. Long-run changes in meat consumption, on the other hand, reflect changing demographics, preferences, technology, and marketing practices in addition to relative prices and incomes. For example, an increase in the number and variety of lowfat and reduced-fat meat choices available likely boosted overall per capita meat consumption during the last decade.

## U.S. per capita food consumption, selected years

Item	Annual average consumption			
	1970-74	1980-84	1990-94	1994
Total meat <sup>1</sup> (lb.)	176.5	179.1	188.3	193.6
Beef	79.1	73.1	63.0	63.6
Pork	47.6	48.3	48.3	49.5
Chicken	27.4	33.9	46.3	49.5
Turkey	6.7	8.4	14.1	14.2
Fish	12.1	13.0	14.9	15.1
Eggs (no.)	299	264	235	238
Shell	265	229	181	177
Processed	34	35	54	61
Beverage milk <sup>2</sup> (gal.)	30.7	26.7	25.3	24.7
Plain	29.0	25.2	23.8	23.2
Whole	23.9	15.7	9.8	9.1
2-percent	4.0	6.8	9.0	8.7
1-percent	.5	1.7	2.4	2.4
Skim	1.5	1.3	2.9	3.3
Yogurt (1/2 pt.)	2.3	5.4	8.0	8.7
Fluid cream <sup>3</sup> (1/2 pt.)	9.7	11.3	14.8	15.2
Cheese (lb.)	12.9	19.5	25.7	26.8
Frozen dairy products (lb.)	28.1	26.7	29.2	30.0
Fats and oils (lb.)				
Salad and cooking oils	16.7	21.7	24.9	24.3
Shortening	17.2	19.0	23.3	24.1
Margarine	11.0	10.8	10.7	9.9
Fruits <sup>4</sup> (lb.)	229.0	260.0	269.1	279.5
Fresh	97.7	107.7	120.9	126.7
Citrus	27.9	24.7	23.1	26.0
Noncitrus	69.8	83.0	97.8	101.7
Processed	131.3	152.3	148.2	152.8
Vegetables <sup>4</sup> (lb.)	335.6	339.0	394.2	398.3
Fresh	148.2	148.6	168.7	170.8
Potatoes	55.5	48.4	48.2	50.2
Processed	187.4	190.4	225.5	227.5
Tomatoes for canning	63.0	62.5	75.6	75.3
Potatoes for freezing	31.7	39.7	53.0	57.8
Flour and cereals <sup>5</sup> (lb.)	135.1	147.0	191.6	198.7
Wheat flour	111.0	117.3	139.8	144.5
Corn products	10.2	14.1	23.1	23.7
Rice	7.2	10.1	17.4	19.0
Caloric sweeteners <sup>6</sup> (lb.)	123.7	122.4	141.6	147.6
Refined sugar	100.5	74.7	64.4	65.0
Corn sweeteners	21.7	46.4	75.8	81.3
High-fructose corn syrup (HFCS)	1.5	27.4	52.8	56.9
Candy	19.0	17.1	21.2	22.1
Beverages (gal.)				
Carbonated soft drinks	26.2	35.4	49.0	52.2
Regular (nondiet)	23.8	29.7	37.5	40.3
Diet	2.4	5.7	11.5	11.9
Coffee	33.1	26.4	24.8	21.1
Bottled water	NA	3.1	8.8	10.5
Beer	19.5	24.3	23.1	22.5
Fruit juice	6.0	7.4	8.0	8.6
Fruit drinks and ades	NA	NA	6.0	5.7
Canned iced tea	NA	NA	.3	.6

Notes: NA = Not available. <sup>1</sup>Boneless weight. Includes lamb, mutton, and veal. <sup>2</sup>Includes flavored milk and buttermilk. <sup>3</sup>Heavy cream, light cream, half and half, sour cream, and eggnog. <sup>4</sup>Farm weight. <sup>5</sup>Includes oat, barley, and rye products. <sup>6</sup>Dry weight. Includes honey, molasses, refiner's syrups, and caloric sweeteners added to commercially prepared foods and beverages.



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## Egg Consumption

U.S. per capita egg consumption fell to a record low of 234 eggs in 1990 and 1991, down from an all-time high of 403 eggs in 1945. Between 1950 and 1990, per capita consumption declined about 4 eggs per year. But since 1991, consumption inched up each year, reaching 238 eggs per person in 1994; the continuing decline in shell-egg consumption has been more than offset by gains in processed-egg consumption.

Per capita consumption of processed egg products—used mainly in manufactured foods or sold to food service operations in liquid form—is projected to account for 27 percent of total egg use in 1995, compared with only 13 percent in 1980-84. If this trend continues, a third of all eggs will be consumed in processed form by 2000.

Several factors favor the steady growth of processed egg products. The traditional market for processed eggs—as ingredients in foods such as pasta, cake mixes, and other baked goods—has continued to grow. Also, the increased safety and convenience of liquid egg products has encouraged use of pasteurized egg products in institutional food service and restaurants.

## Milk and Cheese Consumption

Annual per capita consumption of beverage milks declined from 31 gallons in 1970-74 to 25 gallons in 1994. Consumption of soft drinks may be displacing beverage milk in the diet (see table). Big increases in eating away from home, especially at fast-food places, and in consumption of salty snack foods favored soft drink consumption. Also, the 1980-94 increase in the

Consumer Price Index for fresh milk and cream (42 percent) outpaced that for carbonated soft drinks (34 percent). A threefold increase in per capita consumption of yogurt since the early 1970's—to nearly 9 half-pint servings per person in 1994—partially offset the decline in beverage milks.

The trend in beverage milk is toward lower fat drinks. While whole milk (plain and flavored) represented 78 percent of all beverage milk consumption in 1970-74, by 1994, its share had dropped to 37 percent. In 1994, reduced-fat milk accounted for 50 percent of all beverage milk, and skim milk constituted 13 percent, compared with 18 percent and 5 percent, respectively, in 1970-74. In 1994, skim milk (average fat content of 0.2 percent) was the only beverage milk for which per capita consumption increased; 1-percent milk held steady, while consumption of 2-percent, buttermilk (average fat content of 1.0 percent), and whole milk (average fat content of 3.3 percent) declined. Relative prices and advertising have influenced the shift to lower fat milks. Per capita consumption of milkfat from all fluid milk and cream products declined 36 percent between 1970 and 1994.

Average consumption of cheese—excluding full-skim American and cottage, pot, and baker's cheeses—more than doubled from 12.9 pounds per person per year in 1970-74 to 26.8 pounds in 1994. The growth is concentrated in the ingredient and away-from-home markets. Pizza sales and new products such as boxed cheesy scalloped potato mixes and frozen broccoli-and-cheese contributed to this increase.

## Fruit and Vegetable Consumption

In 1994, per capita consumption of fruits and vegetables was 14 percent higher than in 1980. Higher consumer incomes, increased ethnic diversity, and expanding interest in healthful diets indicate this trend is likely to continue into the next decade.

Americans consumed 127 pounds of fresh fruits in 1994, up more than 12 percent from 1980-84 and up 24 percent from 1970-74. Americans are eating more apples, grapes, bananas, and other noncitrus fruits, but fewer grapefruits and oranges. Improved technology and expanded storage facilities make high-quality U.S.-produced fresh apples and pears available year-round. Imported varieties—such as Granny Smith apples—augmented winter fruit supplies, which had been dominated by citrus fruits.

Exotic or specialty produce—kiwis, mangoes, carambola, jicama, broccoflower, and other new or unusual items—remain in a small but rapidly expanding niche market. Record-high consumption of kiwifruit (more than half a pound per person) and mangoes (1 pound per person) was reported in 1994.

Consumption of fresh salad vegetables rose between 1980 and 1994: Bell peppers were up 130 percent; garlic, 126 percent; broccoli, 101 percent; mushrooms, 64 percent; spinach, 46 percent; cucumbers, 37 percent; carrots, 29 percent; cauliflower, 23 percent; and tomatoes, 22 percent. Specialty lettuce varieties—red and green leaf, romaine, and others—are eroding the market share of iceberg lettuce.

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Consumption of frozen french fries has soared, and now surpasses fresh potatoes. A staple commodity in the United States, potatoes account for about one-third of total per capita vegetable use. The popularity of fast-food restaurants lies behind most of the shift toward frozen potato use.

## Grain Consumption

Per capita use of flour and cereal products reached 199 pounds in 1994 from an annual average of 147 pounds in 1980-84 and 135 pounds in 1970-74. Wheat is the major grain product eaten in the United States, with wheat flour and other wheat products representing 73 percent of U.S. grain consumption in 1994. However, wheat's share of total grain consumption declined 8 percentage points since 1980, as rice, corn, and oat products gained favor.

Consumption of grain mixtures, such as lasagna and pizza, more than doubled between 1977-78 and 1994. Consumption of snack foods—crackers, popcorn, pretzels, corn chips—tripled during this period, and ready-to-eat cereals were up 60 percent. Mexican foods containing grain mixtures were consumed four times more often in 1994 than in the late 1970's.

## Sugar Consumption

In 1994, each American consumed, on average, a record 148 pounds worth of caloric sweeteners. Per capita consumption of caloric sweeteners, mainly sucrose (table sugar made from cane and beets) and corn sweeteners (notably high-fructose corn syrup, or HFCS), increased 25 pounds, or 21 percent between 1980-84 and 1994. Most (more than 70 percent) of high-fructose corn syrup is used in beverages.

A striking change in the availability of specific types of sugars occurred in the past two decades. Sucrose's share of total caloric sweetener use dropped from 81 percent in 1970-74 to 44 percent in 1994, while corn sweeteners increased from 18 percent to 55 percent. All other caloric sweeteners, including honey, maple syrup, and molasses, combined to maintain a 1-percent share.

Refined and processed sugars added to foods and beverages contributed 75 percent of the total sugars available in the 1990 food supply (the latest year for which nutrient availability data are available); other sources of sugars were fruit, 12 percent; dairy products, 10 percent; and vegetables, 3 percent. Carbonated soft drinks contributed 21 percent of the refined and processed sugars in the American diet in 1990. Per capita consumption of regular (nondiet) carbonated soft drinks jumped 13 percent between 1990 and 1994, to 40 gallons (equivalent to 645 8-ounce servings) per person. That compares with 30 gallons in 1980 and 22 gallons in 1970.

Daily U.S. consumption of caloric sweeteners amounted to the equivalent of 45 teaspoons of sugar per person per day in 1994. Of this total, 11 teaspoons of sugar were in the form of carbonated soft drinks. USDA's *Food Guide* suggests a daily limit of 12 teaspoons for persons consuming a 2,200-calorie diet.

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Source: Putnam, J.J. and Duewer, L.A., 1995, U.S. per capita food consumption: Record-high meat and sugars in 1994, *FoodReview* 18(2):2-11.

## Spending Patterns of Families Receiving Public Assistance

Data from the 1992-93 Consumer Expenditure Survey were used to examine expenditure patterns of households receiving public assistance by number of workers, family type, and other socioeconomic and demographic characteristics. Results showed that expenditures of families receiving assistance vary widely, depending on the employment status of adults, the marital status of the household head, and the presence of children.

### General Characteristics

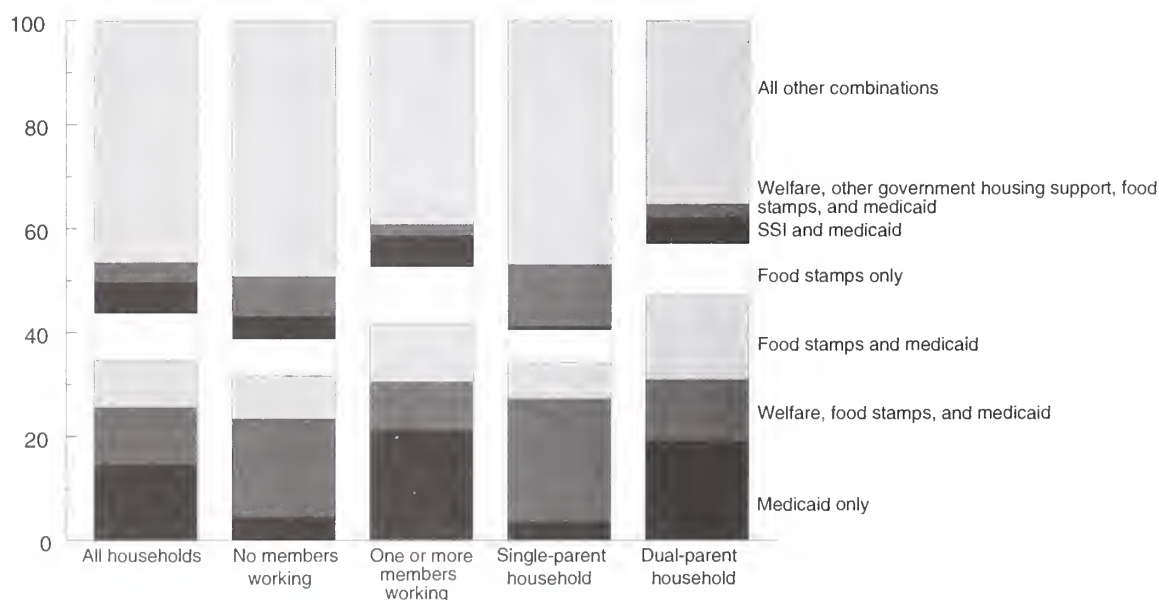
Households that received some type of public assistance were likely to have reference persons who were female (59 percent), under age 65 (79 percent), and be renters (67 percent). Among households with no working members, 69 percent were headed by females and 80 percent were renters; among single-parent families that received public assistance, 95 percent were headed by females and 86 percent were renters. Households that received public assistance but had one or more working members were likely (53 percent) to have a male reference person. Considering only households not receiving public assistance, over half (51 percent) of reference persons had attained a college education—compared with about one-fifth (21 percent) of reference persons in households that received some type of public assistance.

### Combinations of Public Assistance

Households can receive one or more forms of public assistance. A wide range of program combinations was reported by households in the sample, with no combination dominant. The most common was medicaid only—reported by 15 percent, followed by welfare-food stamps-medicaid at 11 percent (see figure). Food stamps-medicaid was reported by 9 percent of sample households, as was food stamps only.

Households with no working members were twice as likely to be receiving welfare-food stamps-medicaid as any other combination of assistance. Also, nearly one-quarter of single-parent households receiving some form of public assistance were receiving this combination. Dual-parent households and those with one or more workers were

**Percent distribution of households receiving public assistance by household type and assistance type, first-quarter 1992 to first-quarter 1994**



Source: Passero, W.D., 1996, *Spending patterns of families receiving public assistance*, *Monthly Labor Review* 119(4):21-28.

## Expenditure shares of households by receipt of public assistance, presence of working members, and family type, first-quarter 1992 to first-quarter 1994

Characteristic	Households receiving		Households receiving public assistance by			
	Some public assistance	No public assistance	No workers	Some workers	Single parent	Dual parent
Total expenditures	\$15,304	\$29,800	\$10,711	\$21,664	\$11,948	\$22,281
	<i>Percentage</i>					
Food	22.4	15.3	28.5	19.4	27.8	20.1
Food at home	19.8	11.0	26.6	16.5	25.7	17.4
Food away from home	2.6	4.3	1.9	2.9	2.1	2.7
Housing	37.1	31.6	43.2	34.0	41.3	33.9
Shelter	22.5	19.2	27.0	20.7	24.7	21.2
Utilities	10.6	7.2	12.8	9.0	12.4	8.5
Other	4.0	5.2	3.4	4.3	4.2	4.2
Apparel	5.0	4.9	5.6	5.1	7.2	4.9
Transportation	15.3	19.2	9.5	19.1	10.2	19.6
Health care	4.3	5.8	2.1	3.4	1.8	3.6
Entertainment	4.1	5.4	3.7	4.6	4.1	4.5
Personal insurance and pensions	5.4	10.6	1.3	7.9	2.6	6.9
Other expenses	6.4	7.2	6.1	6.5	5.0	6.5

Source: Passero, W.D., 1996, *Spending patterns of families receiving public assistance*, *Monthly Labor Review* 119(4):21-28.

more likely to be receiving medicaid only than any other combination of assistance.

### Spending Patterns of Subgroups

Households receiving some form of public assistance reported total expenditures that were about half those of households not receiving public assistance, \$15,304 compared with \$29,800. Expenditure shares were apportioned differently among these two groups: those receiving public assistance spent a higher percentage for food and housing (shelter and utilities) but a lower percentage for transportation and personal insurance

and pensions (see table). Expenditure shares (but not dollars spent) for apparel, health care, and entertainment were similar among both groups.

When households receiving public assistance were compared by whether or not there were any members of the family who worked, total expenditures in families without workers was about half that (\$10,771 vs. \$21,664) in families with one or more workers. Households with no working members spend a higher share of their budget for food and shelter (72 vs. 53 percent) and a lower share for transportation and personal insurance and pensions (11 vs. 27 percent) than did households with at least one working member.

Examining total expenditures and expenditure shares of single-parent versus dual-parent households receiving public assistance shows that single-parent households spend about half the total expenditure (\$11,948 vs. \$22,281) spent by dual-parent households. Also, single-parent households spend a higher share of total expenditures for food, housing, and clothing (76 vs. 59 percent) and a lower share for transportation and personal insurance and pensions (13 vs. 26 percent).

Source: Passero, W.D., 1996, *Spending patterns of families receiving public assistance*, *Monthly Labor Review* 119(4):21-28.



## Relationship Between Poverty and Living Conditions

Being poor means more than having cash income below the official poverty line for a given family size, because cash income is only one factor related to living conditions and the poor are quite heterogeneous. Income measures ignore home ownership and other assets that can be important sources of consumption. People who are retired or whose incomes are only temporarily low may be classified as poor based on income but do not have low consumption. Also, the official poverty rate does not account for taxes or in-kind transfers such as food stamps or government-provided medical insurance—which improve living conditions.

In an effort to determine the relationship between poverty and living conditions, nine national surveys were analyzed. These were:

- American Housing Survey (1993)
- Consumer Expenditure Survey (1992-93)
- Current Population Survey (October 1993 Education Supplement and March 1994 Annual Demographic Supplement)
- High School and Beyond Survey (1992)
- National Crime Victimization Survey (1992-93)
- National Health Interview Survey (1993)
- National Household Education Survey (1993 School Readiness

Component and School Safety and Discipline Component)

National Maternal and Infant Health Survey (1989-90)

Survey of Income and Program Participation—Extended Measures of Well-Being Topical Module (1992)

Estimates of material well-being were derived for individuals<sup>1</sup> living in poor and nonpoor families; in poor, single-parent families; and in families receiving welfare. Poor, single-parent families are defined as families that have incomes below the official poverty threshold, an unmarried head of household, and at least one child under age 18. Families receiving welfare are defined as families with children that report receiving welfare assistance sometime during the reference period.

Findings are presented in seven categories: Income sources, spending patterns, housing, consumer durables and utilities, crime and neighborhood, health and nutrition, and education.

### Income Sources

Poor families differ from nonpoor families both in the levels and sources of their incomes (table 1, p. 46). The average poor person lives in a family whose income is about a sixth as much as the family income of the average nonpoor person (\$8,501 vs. \$55,394). A larger proportion of the income of poor families comes from public assistance and welfare; for those in poor, single-parent families, 40 percent of family income comes from public assistance and welfare.

<sup>1</sup>This methodology differs from that in many other studies where families are the unit studied.

### Spending Patterns

Differences between the poor and the nonpoor in average family expenditures are smaller than differences in average family income. While average family incomes of the non-income-poor are over six times as large as those for the income-poor, average family expenditures of the non-expenditure-poor are only about three times as large as those for the expenditure poor.

According to the data presented in table 1, p. 46, total family expenditures exceed total before-tax family income for all but the nonpoor. Transfer benefits, such as food stamps, are not reflected in the income figures, nor are taxes paid by families. When these are accounted for in income, the spending power of poor families increases.

### Housing

Rates of home ownership vary across income levels and family types. The nonpoor are three times more likely to live in homes they own than are those in poor, single-parent families or those in families receiving welfare. Among poor households, there are many elderly families that have a high rate of home ownership (63 percent). Also, more than half of people in poor, two-parent families live in homes they own. About one-third of individuals living in poor, single-parent families or in families receiving welfare—compared with about one-quarter of individuals in poor families and one-tenth of those in nonpoor families—found their home unsatisfactory enough that they wanted to move.



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## Consumer Durables and Utilities

Almost all of the poor, like the nonpoor, have access<sup>2</sup> to refrigerators, stoves, and color televisions. For other consumer durables, the poor have considerably lower rates of access, particularly clothes dryers and air conditioners. Whereas almost all nonpoor families have a telephone, only 68 to 77 percent of poor families had access to one. Vehicular ownership followed a very similar pattern—almost all nonpoor families owned a car or truck, compared with 64 to 77 percent of poor families.

## Crime and Neighborhood

Individuals who live in poor, single-parent households are much more likely to be victims of crime than are those who live in other households. The poor are less likely to report living in safe neighborhoods and more likely to express dissatisfaction with the communities in which they live.

## Health and Nutrition

Poor mothers are much more likely than nonpoor mothers to experience problems in pregnancy and childbirth. Also, the number of infant deaths within the first year is higher. The percentage of live births with low weight and the rate of preterm births is about twice as high for poor and for single, poor mothers as for nonpoor mothers. Poor and single, poor mothers are much less likely than nonpoor mothers to report prenatal doctor visits during the first trimester.

Although poor and nonpoor children do not differ as to whether they have a usual place to which they go for routine care, poor children are less likely to have a particular place to go to when sick—or the usual place is an emergency room. Poor children are less likely to see a dentist. The poor are less likely to be covered by private health insurance and more likely to be covered by medicare for all or part of the year.

## Education

Poor students are more likely to have repeated a grade and to have been expelled from school. Poor students are considerably more likely to attend schools with security guards and metal detectors. Both poor and nonpoor students have high expectations that they will attend and graduate from college. However, 48 percent of poor students and 70 percent of nonpoor students attend either a 2- or 4-year college; 17 percent of poor students and 33 percent of nonpoor students complete a bachelor's degree.

Home computer use by children varies by income; 23 percent of children in nonpoor families use a computer at home, compared with only 3 percent of children in poor families and 2.5 percent of children in poor, single-parent families. At school, children have similar access: 63 percent of nonpoor students compared with 55 percent of poor and 52 percent of students in poor, single-parent families use a computer at school.

Most poor and nonpoor prekindergarten children are enrolled in a nursery or preschool program. Only 9 percent of poor and 6 percent of nonpoor children did not attend such a program. The poor are more likely to attend Head Start or other public preschool. Only 5 percent of nonpoor children have fewer than 10 books, compared with 27 percent of poor children and 29 percent of poor children in single-parent families.

## Overall Deprivation

Examining one dimension of living conditions at a time probably understates the extent to which families forego other important elements of material well-being. Therefore, an index of deprivation was created using data from the Survey of Income and Program Participation (table 2, p. 48). Included among deprivation indicators were:

1. Evicted in the past year
2. Utilities disconnected in past year
3. Telephone disconnected in past year
4. Housing with upkeep problems
5. Not enough food in past 4 months
6. Crowded housing (more than 1 person per room)
7. No refrigerator
8. No stove
9. No telephone

<sup>2</sup>The Survey of Income and Program Participation asks whether the family has these items in either the home or the building; therefore, actual ownership rates of some items are likely lower.

**Table 1. Selected factors contributing to material well-being**

Factor	Nonpoor families	Poor families	Single-parent poor families	Families receiving welfare
<b>1993-94 Current Population Survey</b>				
Total before-tax family income	\$55,394	\$8,501	\$6,794	\$12,678
Percent income from public assistance/welfare	.2	20.3	39.8	34.6
Percent covered by private health insurance for all or part of the year	80.0	21.1	16.0	—
Percent covered by medicaid for all or part of the year	6.1	54.5	71.6	—
Percent of children under age 15 who use a computer in school	63.3	54.8	51.9	—
Percent of children under age 15 who use a computer at home	23.0	3.2	2.5	—
<b>1992-93 Consumer Expenditure Survey</b>				
Total family expenditures	\$36,926	\$11,596	\$9,172	\$16,280
<b>1993 American Housing Survey</b>				
Percent of persons who own home	77.6	40.8	24.3	24.9
Percent of persons who own a car or truck	97.2	76.8	64.1	65.3
<b>1992 Survey of Income and Program Participation</b>				
Conditions in home unsatisfactory enough that one would like to move	9.5	26.6	33.5	34.5
Items currently in the home or building that are in working condition:				
Washing machine	92.7	71.7	67.5	66.3
Clothes dryer	87.3	50.2	43.9	44.8
Refrigerator	99.5	97.9	98.1	98.2
Color television	98.5	92.5	92.1	92.2
Stove	99.5	97.7	97.3	98.0
Air conditioning	71.9	49.6	46.0	40.7
Telephone	97.2	76.7	69.9	67.5
Percent of persons who say				
Neighborhood safe from crime	93.0	78.1	72.4	67.4
Neighborhood condition bad enough that one would like to move	6.5	18.4	24.5	27.5
Community services bad enough that one would like to move	5.5	15.1	19.7	20.5

(table continues)

**Table 1. Selected factors contributing to material well-being (cont'd)**

Factor	Nonpoor families	Poor families	Single-parent poor families	Families receiving welfare
<b>1992-93 National Crime Victimization Interview Survey</b>				
Household crimes per 1,000 households per year	143.3	207.1	317.6	—
<b>1989-90 National Maternal and Infant Health Survey</b>				
Infant deaths in first year (number per 1,000 live births)	8.3	13.5	14.6	14.3
Percent of live births				
Low birthweight (less than 2,500 grams)	5.5	10.2	12.8	11.6
Preterm (gestation under 37 weeks)	7.3	13.0	15.2	15.1
Percent of mothers with inadequate prenatal care	15.6	43.1	48.8	42.1
<b>1993 National Health Interview Survey</b>				
Percent of children under age 18 who visited dentist in the past year	62.0	41.0	—	—
<b>1993 National Household Education Survey</b>				
Percent of children ages 3-7 with a usual place to go when sick				
Yes - emergency room	5.3	14.7	17.2	—
No	3.1	8.3	6.1	—
Percent of children ages 3-7 with a usual place to go for routine care	41.8	40.1	40.2	—
Percent of students grades 3-12				
Who have repeated a grade	15.4	31.3	31.6	—
Who have been expelled	1.0	3.4	3.5	—
Percent of students grades 6-12				
Who think he/she will attend school after high school	96.1	90.1	90.2	—
Who think he/she will graduate from a 4-year college	89.7	82.7	82.3	—
School has security guards	28.8	43.3	46.2	—
School has metal detectors	4.1	11.5	12.8	—
<b>1992 High School and Beyond Survey</b>				
Percent of persons in 1980 sophomore cohort who				
Attended either a 2- or a 4-year college	69.6	48.3	47.6	—
Completed requirements for a bachelor's degree	32.6	16.9	13.2	—

**Table 2. Overall deprivation in 1992, Survey of Income and Program Participation**

Number of deprivations <sup>1</sup>	Nonpoor families	Poor families	Single-parent poor families	Families receiving welfare
Percent of persons in families with				
One deprivation or more	13.0	55.1	56.8	65.4
Two deprivations or more	3.2	26.9	29.8	33.6
Three deprivations or more	1.0	11.8	12.9	14.6
Average number of deprivations	.19	.99	1.06	1.21

<sup>1</sup> Deprivations counted were: Evicted in past year; utilities disconnected in past year; telephone disconnected in past year; housing with upkeep problems; not enough food in past 4 months; crowded housing (more than 1 person per room); no refrigerator; no stove; no telephone.

These hardships were chosen because each is relatively rare in the overall U.S. population and each represents an element of material well-being important in day-to-day life in this country that has been foregone. The majority of the poor (55 percent) live with at least one of these deprivations compared with only 13 percent of the nonpoor. Overall, the average number of deprivations for the poor, the poor in single-parent families, and those in families receiving welfare is 5 to 6 times higher than for the non-poor.

The measures presented here may overstate the actual deprivation of the poor because differences in possessions may reflect differences in preferences rather than differences in resources. However, differences in living conditions may be understated due to a lack of adjustment for quality—assuming durables owned by the poor were older or of lower quality. Any generalization across the entire poverty population can be misleading.

By definition, raising a family's income will end its poverty. However, higher income does not necessarily eliminate the differences in living conditions identified in this study.

Source: Federman, M., Garner, T.I., Short, K., Cutter, W.B., IV, Kiely, J., Levine, D., McGough, D., and McMillen, M., 1996, What does it mean to be poor in America? *Monthly Labor Review* 119(5):3-17.

## Share of Income Spent on Food

Americans are allocating a declining percentage of their income for food. Between 1980 and 1992, the proportion of income spent on food decreased from 14.2 percent to 11.7 percent. During this period, income rose faster than food prices—overall food prices rose 59 percent, whereas per person income rose 94 percent. Data are from the urban portion of the Consumer Expenditure Survey, conducted by the Bureau of Labor Statistics.

Between 1980 and 1992, annual spending for food consumed at home rose 55 percent (from \$667 per person to \$1,031). At the same time, spending for food consumed away from home rose 69 percent (from \$318 to \$536). Prices for food away from home rose 69 percent, compared with a 55-percent increase for food at home. Thus, spending increased at the same rate as food prices—indicating that Americans bought about the same amount of food in 1992 as in 1980.

Food spending can vary according to demographic characteristics of the household. For example, larger households usually spend more in total dollars, but less per person than smaller households. In 1992, single-person households spent over twice as much on food per person (\$2,146) as did households composed of six or more people (\$878) (see table). Larger households tend to have lower per person food expenditures because they buy more economical packages, have younger children who tend to eat less, and spend more on food at home than on food away from home.

## Average annual expenditures per person for food, selected years

Demographic category	1980	1984	1988	1992
<i>Dollars per person</i>				
<b>All urban households</b>	985	1,173	1,335	1,567
<b>Household size</b>				
One	1,268	1,579	1,910	2,146
Two	1,195	1,375	1,643	1,964
Three	952	1,206	1,325	1,579
Four	891	1,073	1,168	1,382
Five	828	944	1,000	1,134
Six or more	726	801	823	878
<b>Single female parents with children</b>	647	831	918	1,091
<b>Income quintiles</b>				
Lowest	857	861	1,014	1,249
Middle	943	1,171	1,310	1,524
Highest	1,171	1,536	1,638	1,997
<b>Race</b>				
White	1,031	1,235	1,406	1,633
Black	691	771	930	1,150
Other	919	1,111	1,150	1,527

Source: Smallwood, D.M., Blaylock, J.R., Lutz, S., and Blisard, N. 1995, *Americans spending a smaller share of income on food*, *FoodReview* 18(2):16-19.

Single-person households spent 42 percent of their food budget on food away from home in 1992, compared with 20 percent for larger households.

Household size affects the mix of foods purchased. Larger households tend to be more frugal and spend a larger share of their at-home food dollars on basic ingredients and lower cost items, such as cereal products, fluid milk, and ground beef, and a smaller share on bakery products and fresh and frozen seafood, fruits, vegetables, and adult beverages (such as coffee).

Household composition also affects food spending. Married couples without children spent about the same amount per person as did single-person households. Single mothers with children spent about half as much per person as single-person households. Expenditures increased for married couples with children as their children got older, but their spending per person still tended to be less than that of married couples without children.



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As household income increased, food spending for both food at home and food away from home increased. Households in the highest income quintile tend to buy higher quality food items and more convenience foods. In 1992, households in the lowest income quintile (household income averaging \$6,669) spent \$1,249 per person on food, compared with \$1,997 per person for the highest income quintile (household income averaging \$77,311).

Households in the highest income quintile tended to spend more and allocate a larger share of their food budget on food away from home. Those in the lowest income quintile spent 24 percent of their food budget on food away from home in 1992, compared with 40 percent for those in the highest income quintile.

Between 1988 and 1992, spending on food at home increased about 30 percent for all income groups, although each group allocated its money differently. The highest income households increased their expenditures on fish and seafood by about 47 percent, compared with an increase of only 13 percent for the lowest income group. The highest income group increased its spending on fresh vegetables by 34 percent, compared with a 17-percent increase for the lowest income group. Conversely, the lowest income group had a bigger increase in spending on processed vegetables than did the highest income group (43 percent vs. 38 percent). The lowest income group also increased its spending on sugar and sweets by 45 percent, compared with a 31-percent increase for the highest income group. However, expenditures for sugar and sweets per person were higher in the highest income group (\$46) than in the lowest income group (\$35).

There were differences in food spending patterns between Blacks and Whites. Both groups spent about 12 percent of their income on food in 1992. However, since Blacks had lower average incomes and larger household sizes, they tended to spend less per person on food. Other races (including Asians, Native Americans, and Pacific Islanders) spent about 10 percent of their income on food. Annual per person food spending was \$1,633 for Whites, \$1,150 for Blacks, and \$1,527 for other races.

Blacks increased their rate of spending on food between 1988 and 1992 faster than did Whites (24 percent vs. 6 percent). Both racial groups increased their spending on pork and poultry products by over 44 percent, whereas expenditures for beef increased 17 percent for Whites and 21 percent for Blacks.

Food spending also varies according to geographic location and city size. In 1992, households in urban areas tended to spend more on food than did households in rural areas, due in part to their higher incomes and easier access to food away from home. Urban households spent 34 percent of their food budget on food away from home compared with 29 percent for rural households. Whereas expenditures per person for the two groups on food at home were nearly identical, urban households spent \$536 per person on food away from home compared with \$428 for rural households.

Between 1988 and 1992, spending on food away from home rose 16 percent for rural households compared with 5 percent for urban households. This rate of increase was much lower than the 25 to 27 percent in spending on food at home.

Of all the food items surveyed, spending on poultry increased the most between 1988 and 1992, up 59 percent for rural households and 47 percent for urban households. Spending for fruits and vegetables increased about 16 percent for both groups; most of the increase for rural households was for processed products, whereas most of the increase for urban households was for fresh products.

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Source: Smallwood, D.M., Blaylock, J.R., Lutz, S., and Blisard, N., 1995, Americans spending a smaller share of income on food, *FoodReview* 18(2):16-19.

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### Would you like to publish in *Family Economics and Nutrition Review*?

*Family Economics and Nutrition Review* will consider for publication articles concerning economic and nutritional issues related to the health and well-being of families. We are especially interested in studies about U.S. population groups at risk—from either an economic or nutritional perspective. Research may be based on primary or secondary data as long as it is national or regional in scope or of national policy interest, and articles may use descriptive or econometric techniques.

*Family Economics and Nutrition Review* has a new feature that we call Research Briefs. We define Research Briefs as short research articles. In general, our Guidelines for Authors apply (see back inside cover)—with the following exceptions:

**#4—No abstract is required.**

**#5—Text, references, tables, and figures should not exceed 10 pages.**

We invite submission of Research Briefs; manuscripts may contain findings previously presented at poster sessions if not published in proceedings (except for abstract).

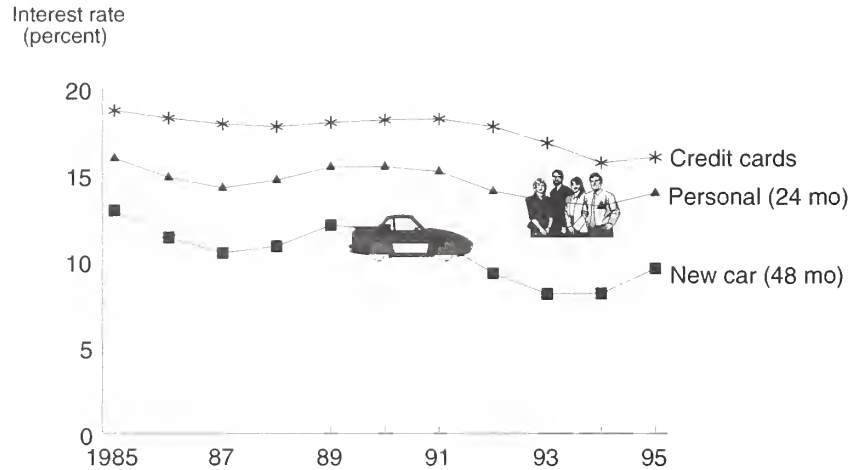
Manuscripts may be mailed to: Joan C. Courtless, Editor, *Family Economics and Nutrition Review*, Center for Nutrition Policy and Promotion. See guidelines on back inside cover for complete address.

### Call for Papers

We are planning a special issue of *Family Economics and Nutrition Review* that will focus on **international data and themes**. If you are interested in writing for this issue, please send your manuscript to the editor following the guidelines listed on the back inside cover of this issue. Research papers and research briefs will be selected for publication. The deadline for receipt of manuscripts is April 1, 1997.

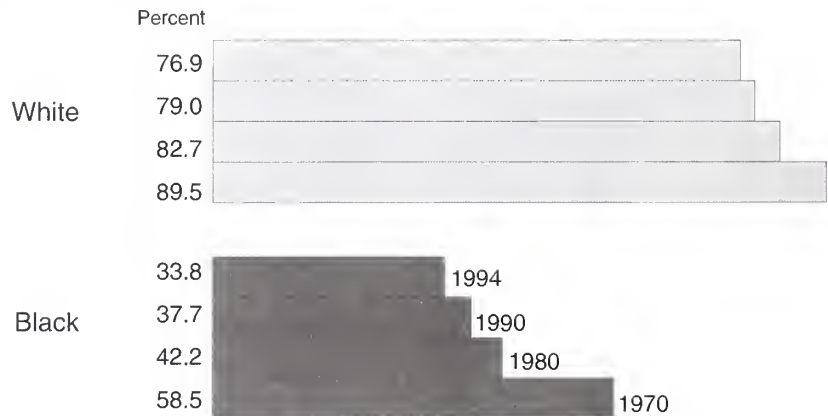
## Charts From Federal Data Sources

### Terms of consumer installment credit



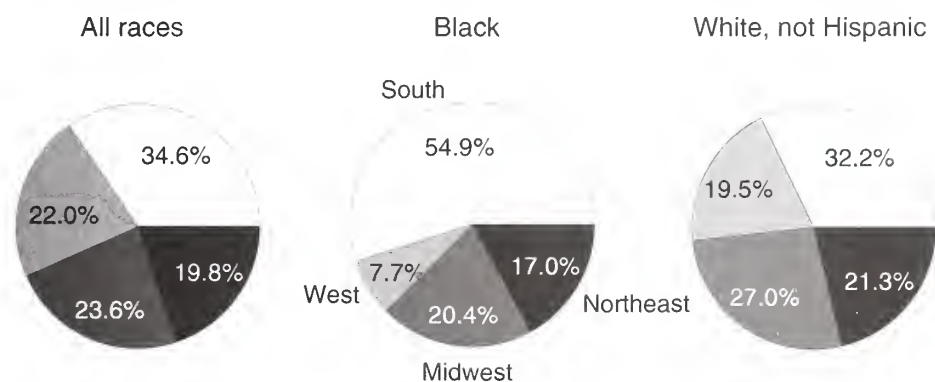
Source: Board of Governors of the Federal Reserve System, *Federal Reserve Bulletins*, Table 1:56.

### Percentage of children under 18 years old living with both parents, by race



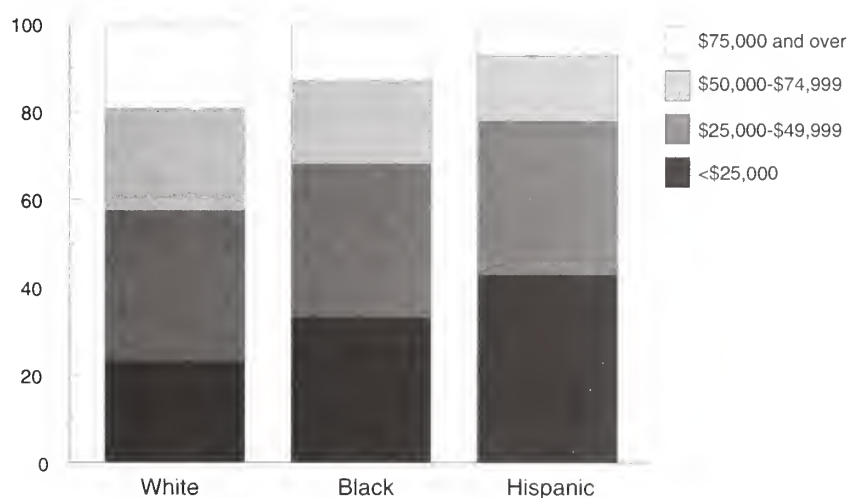
Source: Bennett, C.E., 1995, *The Black Population in the United States: March 1994 and 1993*, Current Population Reports, Population Characteristics, Series P20-480, U.S. Department of Commerce, Bureau of the Census.

## Distribution of the U.S. population by region and race, 1994



Source: Bennett, C.E., 1995, *The Black Population in the United States: March 1994 and 1993, Current Population Reports, Population Characteristics, Series P20-480*, U.S. Department of Commerce, Bureau of the Census.

## Income of married-couple families, by race and Hispanic origin of householders, 1994



Source: Rawlings, S. and Saluter, A., 1995, *Household and Family Characteristics: March 1994, Current Population Reports, Population Characteristics, P20-483*, U.S. Department of Commerce, Bureau of the Census.

## Recent Legislation Affecting Families

**Public Law 104-153 (enacted July 2, 1996)**—the Anticounterfeiting Consumer Protection Act of 1996 seeks to prevent commercial counterfeiting of copy-righted and trademarked goods and services and to ensure that counterfeit goods produced elsewhere cannot enter the United States. Imported counterfeits will be seized and destroyed. The copy-right or trademark holder can opt for judicially determined statutory damages in lieu of actual damages.

**Public Law 104-168 (enacted July 30, 1996)**—amends the Internal Revenue Code of 1986 to provide for increased taxpayer protections. The law establishes a position of Taxpayer Advocate within the Internal Revenue Service (IRS) to resolve problems that taxpayers have with the IRS.

**Public Law 104-170 (enacted August 3, 1996)**—the Food Quality Protection Act of 1996 amends the Federal Insecticide, Fungicide, and Rodenticide Act and the Federal Food, Drug, and Cosmetic Act. The law revises the Federal regulatory scheme for pesticides in agricultural products and provides the Environmental Protection Agency with funds necessary to reregister existing pesticides and for the registration of “minor use” pesticides.

**Public Law 104-180 (enacted August 6, 1996)**—appropriates \$52.8 billion during fiscal year 1997 for Agriculture, Rural Development, Food and Drug Administration, and related agencies. Some of the major allocations in the new law are \$27.6 billion for the Food Stamp Program and \$8.7 billion for Child Nutrition Programs, up from \$26.5 billion and \$8.0 billion in 1996.

**Public Law 104-182 (enacted August 6, 1996)**—rewrites and reauthorizes the Safe Drinking Water Act of 1974. The law aims to refocus Federal regulatory efforts on the substances in tap water that pose the most serious health threats rather than on every possible contaminant. The law also authorizes billions of dollars for a State-administered loan and grant fund to help cash-strapped localities with the costs of compliance.

**Public Law 104-188 (enacted August 20, 1996)**—provides \$10.1 billion in tax relief for small businesses over 5 years, protects jobs, creates opportunities, and increases the take-home pay of workers. The \$4.25 hourly minimum wage rose by 50 cents on October 1, 1996 and will rise by an additional 40 cents on September 1, 1997.

**Public Law 104-191 (enacted August 21, 1996)**—amends the Internal Revenue Code of 1986 to improve portability and continuity of health insurance coverage in the group and individual markets; to combat waste, fraud, and abuse in health insurance and health care delivery; to promote the use of medical savings accounts; to improve access to long-term care services and coverage; and to simplify the administration of health insurance. The law makes it easier for workers to keep insurance coverage if they lose or leave jobs. The law generally requires insurance plans to offer coverage to all employers, their employees, and dependents, regardless of preexisting medical conditions or medical history. They also must offer insurance to individuals who have lost group coverage. The law includes a 4-year pilot program for medical savings accounts, capped at about 750,000 policies. A medical

savings account allows individuals with high deductible insurance plans to accrue tax deductible savings to be used solely for medical expenses.

**Public Law 104-193 (enacted August 22, 1996)**—ends the Federal guarantee of cash assistance to all eligible low-income mothers and children. Instead, States will get broad authority to run their own welfare programs, as well as block grants to offset the costs. Recipients will be required to work within 2 years of receiving benefits and most will be limited to 5 years on the welfare rolls. States will decide whether to deny welfare benefits to children born to welfare recipients. Able-bodied 18- to 50-year-olds with no dependents will be limited to 3 months of food stamps every 3 years, unless they work at least 20 hours a week.



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## Research and Evaluation Activities in USDA

### From the Beltsville Human Nutrition Research Center, Agricultural Research Service

The Nutrient Data Laboratory now offers an online version of Agriculture Handbook No. 8. Called the USDA Nutrient Database for Standard Reference, Release 11 (SR11), this new version has more than 5,600 foods in 22 food group categories and over 337,000 values for more than 70 food components, such as vitamins, minerals, lipids, amino acids, fiber, and energy (calories). SR11 also contains:

- new data on beef and lamb cuts trimmed to 1/8" external fat
- updated values for breakfast cereals
- new food items such as infant formulas, brand name candies, and ethnic foods
- new sodium values for canned vegetables and soups

SR11 is available through the Nutrient Data Laboratory home page on the Internet at:

<http://www.nal.usda.gov/fnic/foodcomp>

and, for those without an Internet connection, through the Nutrient Data Laboratory Bulletin Board at (301) 734-5078.

SR11 is more user-friendly than older releases because it has a relational format. Relational database management software, such as Paradox, Access, or Dbase, can be used to retrieve information and generate reports. Also, there is a search tool on the home page for finding the nutrient content of foods. The user can enter a keyword, select a food and household weight(s), and get a report on the nutrient content of that food.

The Nutrient Data Laboratory is the recognized source of authoritative U.S. food composition data used by epidemiological researchers and food and nutrition professionals. USDA nutrient data also serves as the core for most commercial databases as well as many in other Nations.

### From the Center for Nutrition Policy and Promotion

The Center for Nutrition Policy and Promotion announces a new publication written jointly by the U.S. Department of Agriculture, U.S. Department of Health and Human Services, and the Agency for International Development. This report, called *Nutrition Action Themes for the United States*, was undertaken in response to the commitment made by 159 participating countries at the 1992 International Conference on Nutrition to prepare or improve their national plans of action.

Principles and themes to facilitate the improvement of nutrition security through the end of the 20th century and into the next century were based on the *World Declaration and Plan of Action for Nutrition*, published by Food and Agriculture Organization of the United Nations, World Health Organization in 1992.

The report is in two sections. The first focuses on nutrition within the United States, the "Domestic Section." This section describes the current nutrition situation, the U.S. goal for nutrition, and how nutrition action is achieved in the United States. Seven priority areas are discussed, together with specific strategies for improving the nutrition situation:

- Eating for health
- Nutrition security for all

- 
- Safe food and water from source to table
  - Nutrition monitoring
  - Promoting breastfeeding
  - Nutrition-sensitive food production, economic policy, and agricultural research
  - Human nutrition research

The second major component is the "International Section." This section focuses on international issues and reflects the leadership role of the United States in supporting developing countries' efforts to improve nutritional status. There are nine priority areas:

- Incorporating nutritional objectives, considerations, and components into development policies and programs
- Improving household food security
- Protecting consumers through improved food quality and safety
- Preventing and managing infectious diseases
- Promoting breastfeeding
- Caring for the socioeconomically deprived and nutritionally vulnerable
- Preventing and controlling specific micronutrient deficiencies
- Promoting appropriate diets and healthy lifestyles
- Assessing, analyzing, and monitoring nutrition situations

Limited copies of this report are available. Single copies may be obtained by contacting the Center for Nutrition Policy and Promotion, U.S. Department of Agriculture at (202) 418-2312.

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## Data Sources

### National Hospital Ambulatory Medical Care Survey, Emergency and Outpatient Departments (NHAMCS)

**Sponsoring agency:** U.S. Department of Health and Human Services

**Population covered:** In-person visits to noninstitutional general and short-stay hospitals exclusive of Federal, military, and Veterans Administration hospitals.

**Sample size:** In 1994, the Emergency Department summarized 26,547 patient records from 489 hospitals; the Outpatient Department summarized 29,095 patient records from 489 hospitals.

**Geographic distribution:** Nationwide

**Years data collected:** 1992, 1993, 1994

**Method of data collection:** Reported on Patient Record form by hospital personnel or physician.

**Future surveys planned:** The 1994 report is currently available. The survey is conducted annually and the 1995 data will be available approximately May of 1997.

**Major variables:** The survey gathers information about the health care provided by hospital emergency and outpatient departments in the United States. Variables include patient characteristics (age, sex, race, ethnicity); visit characteristics (reason for visit, cause of injury, expected source of payment, diagnosis,

diagnostic/screening services, procedures, medication therapy, disposition, types of health care professionals seen); and facility characteristics (location, type of ownership).

#### Sources for further information and data:

National Center for Health Statistics  
Data Dissemination Branch  
6525 Belcrest Road  
Hyattsville, MD 20782  
(301) 436-8500

Internet:  
<http://www.cdc.gov/nchswww/nchshome.htm>

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### Youth Risk Behavior Survey (YRBS)

**Sponsoring agency:** U.S. Department of Health and Human Services

**Population covered:** Students in grades 9-12 in public and private schools.

**Sample size:** 10,904 students in 110 schools in 1995.

**Geographic distribution:** Nationwide

**Years data collected:** 1990, 1991, 1993, and 1995

**Method of data collection:** Self-administered questionnaire.

**Future surveys planned:** The 1995 report is currently available. The survey is conducted biennially and the 1997 data will be available approximately late summer of 1998. State and local surveys are also available.

**Major variables:** Six categories of priority health-risk behaviors among youth and young adults are monitored: Behaviors that contribute to unintentional and intentional injuries; tobacco use; alcohol and other drug use; sexual behaviors that contribute to unintended pregnancy and sexually transmitted disease, including HIV infection; unhealthy dietary behaviors; and physical inactivity.

#### Sources for further information and data:

Centers for Disease Control and Prevention  
National Center for Chronic Disease Prevention and Health Promotion  
Division of Adolescent and School Health  
4770 Buford Highway NE, MS-K33  
Atlanta, GA 30341-3724  
(770) 488-5330

## Journal Abstracts

The following abstracts are reprinted verbatim as they appear in the cited source.

**Brech, D.M. 1996. Nutrition: A major role in healthy babies of teen parents. *Journal of Family and Consumer Sciences* 88(2):33-35.**

A national trend exists with over one million adolescents becoming pregnant each year. In the United States, one out of five infants is born to an adolescent. Teenage pregnancy is a risk factor for malnutrition. Nutrition intervention is required for adolescents and their infants to be well nourished. Specific nutrient recommendations exist as a part of the Recommended Dietary Allowances. These requirements can be put into practical meal and snack suggestions using the Food Guide Pyramid. Family and consumer sciences professionals should be strong advocates for providing practical nutrition information to pregnant teenagers.

**Kant, A.K. 1996. Indexes of overall diet quality: A review. *Journal of the American Dietetic Association* 96(8):785-791.**

This article reviews the published indexes of overall diet quality. Approaches used for measuring overall diet quality include those based on examination of the intake of nutrients, food groups, or a combination of both. A majority of the indexes have been examined in relation to nutrient adequacy only; few have been evaluated for assessment of quality according to current dietary guidelines, namely, a diet relatively low in fat that meets energy and nutrient needs. The indexes of overall diet quality were related to the risk of disease more strongly than individual nutrients or foods.

**Laitner, J. and Juster, F.T. 1996. New evidence on altruism: A study of TIAA-CREF retirees. *The American Economic Review* 86(4):893-908.**

This paper investigates the role in household wealth accumulation of saving for bequests. It employs data from a 1988 survey of TIAA-CREF annuitants designed to measure pension and other net worth, as well as lifetime earnings. About half of the households in the data plan to leave estates, and we find that their behavior conforms with theoretical altruistic models. For the same families, the amount of wealth which we attribute to estate building is large. Nevertheless, altruism towards one's children does not seem to be the major explanation of saving in the overall sample.

**Treiman, K., Freimuth, V., Damron, D., Lasswell, A., Anliker J., Havas, S., Langenberg, P., and Feldman, R. 1996. Attitudes and behaviors related to fruits and vegetables among low-income women in the WIC program. *Journal of Nutrition Education* 28(3):149-156.**

This article describes formative research conducted as part of a study aimed at increasing fruit and vegetable consumption among low-income women enrolled in the Special Supplemental Nutrition Program for Women, Infants and Children (WIC). Focus group discussions and central location intercept interviews were conducted with WIC participants

to answer questions such as (1) What are their food shopping, preparation, and eating habits? (2) What perceptions do they have about fruits and vegetables? (3) What barriers do they face to increased consumption of fruits and vegetables? and (4) What motivations and messages might be effective in promoting increased consumption? Results indicated that these women, while generally responsible for food shopping and preparation, did not cook extensively. They reported many positive perceptions of fruits and vegetables, but also identified barriers to increasing consumption, including lack of availability, time and effort to prepare, and preference for other foods. Several implications for nutrition interventions were suggested. First, a key motivation for these women was being a good role model for their children, suggesting a persuasive appeal to use in interventions. Second, review of the women's current eating behaviors led to an identification of five specific behaviors that had the most potential for increasing overall consumption. Finally, the findings suggested ways in which nutrition interventions could address each of the barriers identified.

# Cost of Food at Home

Cost of food at home estimated for food plans at four cost levels, December 1996, U.S. average<sup>1</sup>

Sex-age group	Cost for 1 week				Cost for 1 month			
	Thrifty plan	Low-cost plan	Moderate-cost plan	Liberal plan	Thrifty plan	Low-cost plan	Moderate-cost plan	Liberal plan
<b>FAMILIES</b>								
Family of 2: <sup>2</sup>								
20 - 50 years . . . . .	\$56.40	\$71.40	\$87.90	\$109.20	\$244.30	\$309.20	\$380.80	\$473.30
51 years and over . . . . .	53.10	68.60	84.80	101.60	230.10	297.40	367.30	440.20
Family of 4:								
Couple, 20 - 50 years and children—								
1 - 2 and 3 - 5 years . . . . .	82.20	103.20	126.00	154.90	356.00	446.90	545.70	671.20
6 - 8 and 9 - 11 years . . . . .	94.40	121.30	151.20	182.30	408.80	525.80	655.20	789.80
<b>INDIVIDUALS<sup>3</sup></b>								
Child:								
1 - 2 years . . . . .	14.90	18.30	21.40	26.00	64.40	79.30	92.60	112.60
3 - 5 years . . . . .	16.00	20.00	24.70	29.60	69.50	86.50	106.90	128.30
6 - 8 years . . . . .	19.70	26.40	33.00	38.40	85.30	114.60	142.90	166.40
9 - 11 years . . . . .	23.40	30.00	38.30	44.60	101.40	130.10	166.10	193.10
Male:								
12 - 14 years . . . . .	24.20	33.90	42.10	49.50	104.90	146.80	182.20	214.30
15 - 19 years . . . . .	25.00	34.90	43.40	50.20	108.50	151.10	188.10	217.50
20 - 50 years . . . . .	27.00	34.60	43.10	52.20	116.80	149.80	186.80	226.30
51 years and over . . . . .	24.40	33.00	40.60	48.70	105.50	142.80	175.80	210.80
Female:								
12 - 19 years . . . . .	24.30	29.20	35.40	42.80	105.30	126.70	153.40	185.40
20 - 50 years . . . . .	24.30	30.30	36.80	47.10	105.30	131.30	159.40	204.00
51 years and over . . . . .	23.90	29.40	36.50	43.70	103.70	127.60	158.10	189.40

<sup>1</sup>Assumes that food for all meals and snacks is purchased at the store and prepared at home. Estimates for the thrifty food plan were computed from quantities of foods published in *Family Economics Review* 1984(1). Estimates for the other plans were computed from quantities of foods published in *Family Economics Review* 1983(2). The costs of the food plans are estimated by updating prices paid by households surveyed in 1977-78 in USDA's Nationwide Food Consumption Survey. USDA updates these survey prices using information from the Bureau of Labor Statistics, *CPI Detailed Report*, table 4, to estimate the costs for the food plans.

<sup>2</sup>Ten percent added for family size adjustment. See footnote 3.

<sup>3</sup>The costs given are for individuals in 4-person families. For individuals in other size families, the following adjustments are suggested: 1-person—add 20 percent; 2-person—add 10 percent; 3-person—add 5 percent; 5- or 6-person—subtract 5 percent; 7- or more-person—subtract 10 percent.



# Consumer Prices

Consumer Price Index for all urban consumers [1982-84 = 100]

Group	Unadjusted indexes			
	December 1996	November 1996	October 1996	December 1995
All items . . . . .	158.6	158.6	158.3	153.5
Food . . . . .	156.3	155.9	155.4	149.9
Food at home . . . . .	157.7	157.2	156.8	150.3
Food away from home . . . . .	155.0	154.7	154.2	150.4
Housing . . . . .	154.0	153.9	154.0	149.7
Shelter . . . . .	172.3	172.4	172.5	167.4
Renters' costs <sup>1</sup> . . . . .	179.1	179.9	181.3	173.2
Homeowners' costs <sup>1</sup> . . . . .	178.8	178.6	178.1	174.0
Household insurance <sup>1</sup> . . . . .	162.4	164.6	163.4	158.3
Maintenance and repairs . . . . .	141.5	141.1	140.2	136.6
Maintenance and repair services . . . . .	148.0	147.6	147.3	142.1
Maintenance and repair commodities . . . . .	132.6	132.3	130.5	129.1
Fuel and other utilities . . . . .	129.4	128.4	128.7	123.7
Fuel oil and other household fuel commodities . . . . .	110.3	105.9	102.9	89.6
Gas (piped) and electricity . . . . .	122.8	121.7	122.7	118.3
Household furnishings and operation . . . . .	125.0	124.8	125.0	123.8
Housefurnishings . . . . .	111.0	110.8	111.1	111.1
Apparel and upkeep . . . . .	130.3	133.4	133.4	130.6
Apparel commodities . . . . .	126.5	129.9	130.0	127.1
Men's and boys' apparel . . . . .	127.8	131.2	129.2	126.0
Women's and girls' apparel . . . . .	123.3	126.7	127.1	124.7
Infants' and toddlers' apparel . . . . .	126.9	126.7	128.5	128.7
Footwear . . . . .	125.9	127.7	128.0	124.1
Apparel services . . . . .	161.5	160.9	160.6	157.7
Transportation . . . . .	145.2	144.8	143.9	139.1
Private transportation . . . . .	141.7	141.5	140.5	136.6
New vehicles . . . . .	145.4	144.8	143.8	142.8
Used cars . . . . .	155.6	156.5	157.0	158.2
Motor fuel . . . . .	108.6	107.8	105.9	96.4
Maintenance and repairs . . . . .	160.6	160.5	160.5	155.7
Other private transportation . . . . .	176.0	176.2	175.4	172.4
Public transportation . . . . .	189.9	187.3	187.2	170.7
Medical care . . . . .	230.6	230.5	230.1	223.8
Medical care commodities . . . . .	212.0	211.9	212.4	206.6
Medical care services . . . . .	235.0	234.9	234.2	227.8
Professional medical services . . . . .	211.0	210.9	210.2	203.9
Entertainment . . . . .	160.8	160.7	159.8	156.2
Entertainment commodities . . . . .	144.1	144.0	143.6	140.7
Entertainment services . . . . .	180.5	180.3	178.9	174.6
Other goods and services . . . . .	218.7	219.2	218.8	211.1
Personal care . . . . .	150.5	151.2	150.9	148.9
Toilet goods and personal care appliances . . . . .	142.8	144.7	144.6	144.1
Personal care services . . . . .	159.2	158.6	157.9	154.3
Personal and educational expenses . . . . .	252.9	252.8	252.5	241.8
School books and supplies . . . . .	231.1	230.7	230.5	219.0
Personal and educational services . . . . .	254.8	254.7	254.3	243.7

<sup>1</sup>Indexes on a December 1982 = 100 base.

Source: U.S. Department of Labor, Bureau of Labor Statistics.

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